6.

AN ESSAY

ON THE BEST MODES OF REPRESENTING ACCURATELY,

BY

STATISTICAL RETURNS,

THE

PRESSURE AND PROGRESS OF THE CAUSES OF MORTALITY

AMONGST DIFFERENT CLASSES OF THE COMMUNITY, AND AMONGST THE POPULATIONS OF DIFFERENT DISTRICTS AND COUNTRIES,

WITH

ADDITIONAL PROOFS AND ILLUSTRATIONS OF THE DOCTRINE ADVANCED IN THE SANATORY REPORT,

THAT EPIDEMIC DISEASES INCREASE THE PRESSURE OF POPULATION.

BY EDWIN CHADWICK, Esq.

From the Quarterly Journal of the Statistical Society of London, April, 1844.

On the best Modes of representing accurately, by Statistical Returns, the Duration of Life, and the Pressure and Progress of the Causes of Mortality amongst different Classes of the Community, and amongst the Populations of different Districts and Countries.—By Edwin Chadwick, Esq., F. S. S.

[*Read before the Statistical Society of London, December 18th,* 1843.]

It has for some time been my wish to call the attention of the Fellows of the Society, and through them the attention of statists in Europe and America, to the best modes of keeping mortuary records, and preparing statistical returns, to show the duration of life and the pressure and progress of the causes of mortality, and the numbers of the population in different districts and countries.

The first topic on which I would ask the attention of the Society, is as to what is the best mode that is at present practicable of representing the annual mortality in any population.

With the permission of the council I am enabled to present for consideration those parts of an official report in which I have endeavoured to illustrate this subject.

The mode generally in use is to take the proportions of deaths to the population, to represent the comparative mortality in different districts; and these proportions are generally given by statists, and received by the public, as representing the average ages of death in any population.

Dr. Price, in his work on Annuities and Reversionary Payments, states that in his time the proportion of deaths in London within the bills of mortality, was rather more than 1 to 22 of the population annually, which he states as an equivalent proposition to saying that the average duration of life to all who died was 22 years. Or, to use his own words, he states that—"One with another, then, they will have an expectation of life of 22½ years; that is, one of 22½ will die every year." (p. 255.) In p. 274 he observes, that—

"In the dukedom of Wurtemberg, the inhabitants, Mr. Susmilch says, are numbered every year; and from the average of 5 years, ending in 1754, it appeared that, taking the towns and country together, 1 in 32 died annually. In another province which he mentions, consisting of 635,998 inhabitants, 1 in 33 died annually. From these facts he concludes, that, taking a whole country in gross, including all cities and villages, mankind enjoy among them about 32 or 33 years each of exist-

ence. This, very probably, is below the truth; from whence it will follow, that a child born in a country parish or village has at least an expectation of 36 or 37 years; supposing the proportion of country to town inhabitants to be as 3½ to 1, which, I think, this ingenious writer's observations prove to be nearly the case in Pomerania, Brandenburg, and some other kingdoms."

By Mr. Milne, in his work on Annuities, and in his article on mortality in the last edition of the Encyclopedia Britannica, by Dr. Bissett Hawkins, and by nearly all statistical writers, the proportions of deaths to the population, and the average ages of death, are treated as equivalent. Dr. Southwood Smith has been misled to adopt the same view. He states in his work on the Philosophy of Health, p. 135, that "There is reason to believe that the mortality at present throughout Europe, taking all countries together, including towns and villages, and combining all classes into one aggregate, is 1 in 36. Susmilch, a celebrated German writer, who flourished about the middle of the last century, estimated it at this average at that period. The result of all Mr. Finlaison's investigations is, that the average for the whole of Europe does not materially differ at the present time." "It has been shown that the average mortality at present at Ostend, is 1 in 36, which is the same thing as to assert, that a new-born child at Ostend has an expectation of 35½ years of life."

Reference is usually made to the writings of Mr. Milne as the authority ~~on~~ whom the proportions of deaths to the population are taken as equivalents of the ages of death, and as data for the construction of tables to show the expenditure of life.

Mr. Milne's data are thus stated in his chapter "On the construction of Tables of Mortality," in the article, "Mortality," in the "Encyclopædia Britannica:" "Now let us suppose," says he, "the population of a place to have remained invariable for one or two hundred years past" (a state of things which it might be difficult to find in any moderate sized market-town for two or three years, much less two centuries), "during which period 10,000 children have been born alive at 10,000 equal intervals of time in each year" (a state of things to which it would be equally difficult to find an approximation at any time or in any place); "also that there having been no migration" (another state of things equally difficult to find), "and the law of mortality having been always the same, both the number of the living and that of the annual deaths have remained constant; the whole of the annual deaths at all ages, as well as the number of annual births, having been 10,000." "Then, if the law of mortality, exhibited in the above table, be that which obtains in the place just mentioned, that table will represent the stream of life which flows through it, and fills the vacancies left by those who advance in age, or are carried off by death, their successors incessantly following and being followed in the same course."

Having assumed these data, he reasons upon the assumption (which, for practical purposes, to which such reasonings are proposed to be applied, appears to me to be as misleading as would be reasoning in physics for practical purposes on assumptions of a perfectly calm sea, and a perfectly regular wind or stationary atmosphere, for two centuries), —and, by a chain of fifteen more propositions, none of which I shall attempt to controvert, demonstrates that "the number of years in the expectation of life at any age is the same as the number of living persons

at that age and upwards, out of which one dies annually. Thus, for example, the expectation of life at 40 years of age being 25·495 years, the proportion of the living in the place, aged 40 years and upwards, who die annually, is 1 of 25·495, or, which is the same, 1000 out of 25,495."

Having of late had occasion to make rather extensive observations on this subject, it appears to be a public duty to state, that in no class of persons, in no district or country, and in no tract of time, has the fact hitherto appeared to be in coincidence with these hypotheses; and also that returns of the proportions of deaths to the population, when taken singly, as the exponents of the average duration of life, are often mischievously misleading, exaggerating those chances of life sometimes to the extent of double the real amount. If Dr. Price, instead of resting satisfied with Susmilch's hypothesis, had taken the actual ages of the dying within the bills of mortality, he would have found only a casual approximation to the hypothesis for the whole metropolis; and if he had taken the worst conditioned districts, that, as applied to them, he would probably have found he was in error full one-half. On Mr. Milne's own data it appears, that the proportions of deaths to the population at Carlisle, instead of coinciding with the ascertained average ages of death (i.e. 38·72,) were in the year 1710, 1 in 35; in 1787, they were one in 43; and in 1801, they were 1 in 44. Having caused an average to be deduced from the actual ages of 5,200,141 deaths which occurred in the Prussian States from 1820 to 1834, it appears that instead of 36 years, the actual average age of deaths was only 28 years and 10 months. The average ages of death in France, as deduced from Douvillard's table, founded on the experience of one million of deaths, instead of being 36 years, was 28 years and 5 months.

The public errors, created and maintained by taking the proportions of deaths as exponents of the average ages of death, or of the chances of life to the population, may be illustrated by reference to the actual experience amongst nearly two millions of the population, or upwards of forty-five thousand deaths in thirty-two districts, equivalent to as many populous towns, which the Registrar-General has obligingly enabled me to examine for the year 1839.

The Carlisle table is taken as the standard for the duration of life, to measure the loss of life in the several districts, as that table gives the probability of life from infancy, well ascertained for one town, and nearly coincides with the experience of the annuity offices, on the select class of lives insured by them, and with the results which I have obtained from the mortuary registries, showing the average age of death in the county of Hereford. Each of the recognized insurance tables may, however, be used. If the Carlisle table be taken, the chances of life at infancy would be 38·72; by the Chester table it would be 36·70; by the Northampton, 25·18; by the Montpellier table, 25·36; by the last Swedish table, 39·39; by the experience of Geneva, 40·18. After the attainment of twenty years of age, these several tables give the chances of life as follows:—by the Carlisle table it would be 41·46; by the Chester table, 36·48; by the Northampton table, 33·43; by the Montpellier table, 37·99; by the Swedish table, 39·98; by the Geneva experience, 37·67; and by the experience of the Equitable Society, 41·67. For civic purposes in this country, the most important period for considering the chances of life is after coming of age, or after the attainment of twenty-

one years; the average ages of all who die above that age, in each district of the metropolis, are therefore given to illustrate the extent of loss of life to each class of adults, which is the more important to be observed, as it has been hastily supposed that the pressure of the more common and removeable causes of disease is almost exclusively upon the infant population.

In illustration of the errors occasioned by taking the proportions of deaths as the exponent of the duration of life; if we take the proportions of deaths in the district of Islington, with its population of 55,720, we find the number of deaths for the year only 1 to every 55 of the population, which would appear to be 16 years beyond the chances given by the chief insurance table, deemed a healthy standard; whereas, when we examine the average death of all that population who have died during that year, we find it to be only 29 years; in other words, we find that the average duration of the period of existence has even in that district been shortened by at least nine years below the period assigned by the Carlisle table. If we examine the pressure of the causes of death upon each class of the community, in the same district, we find that the class of artisans, instead of attaining 39 years, have, on the average, been cut off at 19 years; and hence that children and adults, and on the average all those of the labouring classes who have died, have been deprived of 20 years of the natural expectation of life; and that even the class of adults who have died have been deprived of 15 years of working ability, involving extensive orphanage and premature widowhood. If we take such a district as Bethnal Green, inhabited by weavers and a badly conditioned population, the returns of the proportionate number of deaths to the population (1 in 41) would lead to the supposition of an average vitality of nearly double the real amount, which appears from this year's return to be only 22 years for the whole population. For the lowest classes in that district it is no more than 18 years. In the parish of St. Margaret, Leicester, which has a population of 22,000, almost all of whom are artisans engaged in the manufacture of stockings, where the average age of death in the whole parish was, during the year 1840, 18 years, I succeeded in obtaining the ages of death in the different *streets*, when it appeared that this average was made up as follows:—Average age of deaths in the streets that were drained, (and that by no means perfectly,) 23½ years; in the streets that were partially drained, 17½ years; in the streets that were entirely undrained, 13½ years. Though the defective drainage and cleansing was the main cause, it was doubtless not the only cause of this variation. That, however, was a year of a heavy mortality, and the average age of death in that and another district, during the years 1840, 1841, and 1842, was in the streets drained, 25½ years; in those partly drained, 21, and those not drained 17 years. The general average was 21 years. The proportions of death to the population in Leicester were, during the same period, 1 in 36½.

So far as estimates of the number of the people, before a census was taken, may be depended upon, it appears that the proportionate numbers of deaths in the metropolis were, at the commencement of the last century, 1 to 20. At the time the first census was taken (1801) the proportion of deaths to the population within the bills of mortality appeared to be 1 to 39. At the present time it appears to be 1 to 40. Having had the average ages of death within the bills of mortality in the metropolis, cal-

culated from the earliest to the later returns published, they appear to be, as far as they can be made out from the returns, which are only given in quinquennial and decennial periods, as follows:—

Of all returned as having died during the—

	The average Age was: Years,	Months,
22 years, from 1728 to 1749	25	1
25 years, from 1750 to 1774	25	6
25 years, from 1775 to 1799	26	0
25 years, from 1800 to 1825	29	0
6 years, from 1825 to 1830	29	10

Thus, whilst it would appear from the proportionate number of deaths to the population, that the average duration of life in the metropolis has doubled during the last century, it appears from the returns of the average ages themselves, that it has only increased four years and nine months, or about one-fifth. The district of the old bills of mortality comprehends little more than one-half of the metropolis. The average age of death for the year 1839, for the whole metropolis, it will have been seen, is only 27 years. So far as an average for that year for the old district can be made out from the several recent returns, it would appear to be no more than 26 years. But the earlier mortuary registration was known to be extremely defective, especially in the registration of deaths in the poorer districts, and the recent lower averages are ascribable to the closer registration of the infantile mortality in those districts. The earlier returns are only to be regarded in so far as the errors from period to period are likely to have compensated each other; they are only adduced as indicating the degree of proportionate progression, correspondent with the general physical improvements of the population. But the slow general improvement, made up by the great improvements of particular classes, is consistent with the positive deterioration of others. The average age of death of the whole of the working classes we have seen is still no more than 22 years in the whole of the metropolis. In large sub-districts, if we could distinguish accurately the classes of deaths, the average would be found to be not more than half that period: a rate of mortality ascribable to increased over-crowding and stationary accommodation, greatly below anything that probably existed at the commencement of the century. The chief errors in the ordinary statistical returns are errors which cause the extent of the evils which depress the sanatory condition of the population, and the mortality consequent on those evils to be under-estimated.

The erroneous conclusions as to the ages of the populations from the proportions of deaths, have perhaps arisen from assumptions of the existence of states of things rarely, if ever, found, namely, perfectly stationary populations, and perfectly stationary causes of death. I have been asked, "If 1 out of 40 die yearly, must not the average age of all who die be 40 years?" The answer, by actual experience, as we have seen, is, that it is often not 30 years; and perhaps the reason why it is not so will be most conveniently illustrated by hypothetical cases. For example, let it be assumed that in any given year 40 persons die out of 1600, which is in the proportion of 1 to 40, and in consequence of an unusual prevalence of measles, or some disease to which children are subject, the greater number of deaths occur amongst the infant portion of the population, and hence, out of the 40 deaths, 20 occur at 5 years of age, 10 at

25, and 10 at 60. Then the total existenee had, would have been (20 × 5) + (10 × 25) + (10 × 60) = 100 + 250 + 600 = 950 years, and this divided by 40, the number who died, would give $\frac{9}{4}\frac{5}{0}$ = 24 years, nearly as the average duration of life to eaeh of the 40 who died.

On the other hand, suppose a severe winter, in whieh the peeuliar causes of mortality may have pressed unusually heavy upon the older lives, and let the numbers who died have been 20 at 60 years of age; 10 at 40; and 10 at 5; in sueh ease, the total existenee enjoyed would have been (20 × 60) + (10 × 40) + (10 × 5) = 1200 + 40 + 50 = 1650 years, whieh, divided by 40, would give $1\frac{6}{4}\frac{5}{0}$ = 41¼ years, as the average duration of life to eaeh.

And again, where, in faet, the proportion of death in one year may be represented as 1 death out of 20 of the population; the average existenee enjoyed may be greater than when 1 in 40 died for the reason given in the former ease. As for example, in the year when 1 in 20 died, it may have happened that the deaths were among the older lives, and that, taking one with another, the average age of all who died might be 50; while in the other ease the mortality might have been amongst the infant population, when the average age might have been 20. If the proportion of 1 in 40, or 1 in 20, were to obtain each year eontinuously, taking one life with another, the average duration to a population just born, of whom 1 in 40 died, and whose plaee should be supplied eaeh year by a new birth, would be about 20 years to eaeh life, or one-half; and of a similar population, of whom 1 out of 20 died annually, the average duration of life to eaeh would be about 10 years, or one-half the period at the expiration of whieh all the lives would have expired.

When these examples are eonsidered, it will be understood that the average age of death may remain stationary, or may go on inereasing, whilst the proportions of death remain the same, or vary. The aetual mortality of most distriets is found to be eoineident ehiefly with its physieal eondition, and is most aeeurately measured by the years of vitality whieh have been enjoyed, *i. e.* by the average age of death, or the total numbers of years whieh every individual who has died has lived, divided by the numbers who have died. The numbers of deaths inerease or diminish eonsiderably, and frequently ereate erroneous impressions, whilst the average ages of death are found to maintain a eomparatively steady course, always nearest to the aetual eondition of the population, and give the most sure indieations.

The chief test of the pressure of the eauses of mortality is then the duration of life in years; and whatever age may be taken as the standard of the natural age, or the average age of the individual in any eommunity may be taken to judge what are the standard numbers of death in that same eommunity. For example, in the returns of the St. George's Hanover Square distriet, it appears that in 1839, the proportions of death was 1 to 50 of the population; but the average numbers of years whieh 1325 individuals, who died during that year, had lived, was only 31 years, or 8 years below the average period of life in Carlisle. There was then in that distriet during that year a total loss of 10,600 years of life, which, at 39 years, may be eonsidered as equal to an exeess of deaths of 272 persons, and in a healthy state the proportions of deaths should have been 1 in 63, instead of 1 in 50 of the population.

The effeet of migration or of emigration, in disturbing the results of re-

turns of the average ages of death in particular localities, appears to be commonly much exaggerated.

As formerly, when navy surgeons, overlooking the filth of their ships, which has of late been removed, and not perceiving the effects of the atmospheric impurities arising from the over-crowding, which have since been diminished by better ventilation, directed their whole attention to supposed distant causes and mysterious agencies, and were wont to ascribe the whole of the fever which ravaged a fleet to infection from some casual hand, who was found to have been received on board from some equally filthy and ill-kept prison, where the "gaol fever" had been prevalent; so now, in some of our towns, we find much ingenuity exercised to avoid the immediate force of the facts presented by such returns, by a search for collateral and incidental defects in them. Thus, in Liverpool the whole of its vast excess of mortality has been charged upon the poorer passengers who pass through the port. In other towns, also, all the excess of deaths from epidemic or infectious disease is charged upon the vagrant population. In New York and some of the American cities, where inquiries have been stimulated by the example of the sanatory inquiry in this country, a common observation made on the proved excess of mortality is, that a large proportion of "foreigners" frequent the city. An inquiry into the cases themselves would generally show that if, instead of the proportion of the immigrant population being a small per centage, it formed a very large proportion of the population included; still the proportion per cent. of sickness and mortality, from consumption and other diseases, amongst the resident population, is the greatest; and that even in lodging-houses the disease most frequently appears first in the occupants who are stationary, and last in the new comers. In some badly conditioned districts, where there is a very severe mortality observable in children, a less proportionate amount of mortality prevails amongst the adults who are migrant, than on other adults resident in somewhat less depressed districts, but who are more stationary. Of all classes, (unless it be the higher classes, who resort to watering-places,) it is not the sickly and the weakly who travel for subsistence as handicraftsmen, or for subsistence in commerce, but the healthy and robust. In so far as the general results of mortuary registration of any district are disturbed by a population who are migrant, (who are not only above the average strength, but who generally come with the additional advantage of health, by travel in the open air and a purer atmosphere,) they are usually disturbed by unduly raising and giving the locality an appearance of an average of health, and the fatally deceptive chances of longevity that do not belong to it. Whilst, therefore, the localities gain by the average health and strength of the migrant population, other districts have the credit of a share of the excess of disease and mortality which really belong to unhealthy localities. In other words, the population migrating through such districts carry away more disease and mortality from the crowded districts than they take into them. If there had been a mortuary registration at Walcheren, or any pestilential stations productive of an excessive mortality in the army, the registries probably would not have given the localities credit for more than half the mortality which belonged to them. The real sickness and mortality of the more depressed town districts are often made to appear lower than they are by the number of cases treated in distant workhouses,

hospitals, and dispensaries, for which no credit is given to the locality where the cause of death occurred.

It would doubtless proportionately enhance the value of such returns as those in question, if the rule were fully carried out, that "the population enumerated must always be precisely that which produces the deaths registered;" the grand desideratum being, as expressed by Mr. Milne, for insurance purposes, "to determine the number of annual deaths at each age which takes place among the living at the same age;"* but the facts cited of the greater proportion of adults, and of health in those adults who are immigrant, will answer the objections to the superior applicability to local or class insurance tables, deduced from actual local observation of the local rate of mortality prevalent amongst that population, whether migrant or stationary, and without reference to the actual ages of the living (though that were desirable), compared with deductions from any general insurance table, *i. e.*, the experience of a distant and wholly unconnected population. Deductions from tables, however correctly made from the experience of other towns, must be, and are proved, by such experience as that hereafter cited, to be, merely "guess-work." Vide 'General Sanatory Report,' pp. 218, 219. For myself, I make it a general rule of precaution neither to receive nor adduce statistical returns as evidence without previous inquiry, wherever it is possible, into the particulars on which they are founded, or with which they are connected. I adduce them less as principal evidence, proving anything by themselves, than as proximate measures, or as indications of the extent of the operation of causes substantiated by distinct investigations. The general conclusions which the facts that have come to my knowledge tend to establish on the subject of the experience of mortality are, that there is no general law of mortality yet established that is applicable to all countries or to all classes, or to all times, as commonly assumed; that every place, and class, and period has rather its own circumstances and its own law, varying with those circumstances; that the actual experience of any class, or place, or period (even with the disturbances of any ordinary amount of migration, or immigration, or any ordinary influx of young lives from births) is a safer guide than any insurance table deduced from the experience of another people living at another time and place, or any assumed general law.

Though the mean of the actual years of life attained by any population may be the more correct standard for all general purposes, than the proportions of death to the population, yet when the mean ages of deaths are deduced from a miscellaneous and fluctuating population, it doubtless appears to be subject to another source of inaccuracy which requires attention. If the population be increasing, it may be assumed that the increase will be from an increasing number of births; that there will in this case be a larger proportion of young lives from which the deaths will be taken, it being commonly assumed that a certain and unvariably heavy rate of mortality is a necessary incident to infantile life. It is, however, an unproved assumption, that the increase of population arises always and wholly from the increase of births. The increase may, and often does, take place, from the removal of causes of mortality, from an increase of health, and from fewer deaths among the adults, in

* Art. 'Mortality,' Ency. Britan. last edit., p. 524.

the various stages of adult life. It will be hereafter seen, from the increase in the average ages of the living which appears to have taken place in the United Kingdom since the last census, when the ages were taken, that this increase of health in certain classes of adults, is probably a considerable element of the increase in the numbers of the population. The increase in the numbers of the population of any district may have arisen from immigration. The returns under the last census of the birthplaces of the inhabitants shows that in the towns this has been a very considerable element of increase, and in some instances there is strong reason for believing that it must have been the only one.

There are a few places where the population has remained stationary, and the increase having been general, differences of the different rates of increase in different places, will, I apprehend be found not to affect in any considerable degree returns of the average ages of death, as the best available means of comparison of the pressure of the causes of mortality between place and place. But in the comparisons made between town and country, the increase of population in the towns having been made up chiefly by immigration, and that mostly of young unmarried persons, and in all cases of persons of a more vigorous constitution, this increase of population, as already stated, must *increase* the mean ages of death beyond the term properly due to the native town populations.

I cannot, however, permit to pass unchallenged generally assumed "laws" of a heavy mortality as being necessarily and indiscriminately applicable to every stage of infant life. It has been shown, in the Sanatory Report, that in the same districts where one-fourth of the children of the gentry died, more than one-half the children of the working classes have died, and this excess of deaths amongst the poorer classes was traced to preventible causes. The experience of Geneva, and other places which may be cited, I submit disprove the assumption that a large mass of human life is necessarily created to be immediately destroyed.

Yet on this assumption it has been objected that the mean ages of death can only be used as a standard where the ages of the living are ascertained; for that where there is a young population, there *must* be a greater mortality than where there is an old population. This objection substitutes the effect for the cause; it says, "There must be an excessive mortality, because there is an excessively young population;" the facts, when investigated, I apprehend, reverse the sequence, and show that there is an excessively young and burthensome population, because there is an excessive mortality. The excessive mortality slaughtering infants quickens births, from physical laws already explained:—sweeping away adults of the marriageable age before their time, it opens places of work and subsistence, to be occupied by other young adults, and quickens marriages with the young; it sweeps away adults before they attain old age, and thus produces a young population in large numbers. A low average age of death, if continued for any length of time, produces, and is found generally to indicate, the existence of young population. I have examined, with a view to its introduction as an element of vital statistics, the mean ages of the *living* amongst whom the deaths returned occur. Though the pressure of the causes of mortality affects the ages of the entire *living* population, it does not, so far as yet has been observed, affect them in any perceptible coincidence with the mean ages of death. The apparent reason for this is, that in the worst-conditioned districts the

gaps made by death in the ranks of the adults are to a great extent immediately filled up by the immigration of adults, which we know takes place in towns; and the infantile deaths are made up by the rapid reproduction which in all the places yet examined keeps a-head of the mortality of that class. The infantile deaths in one district are sometimes more than double the infantile deaths in another; yet, from the increased amount of births, the *proportions* of the living at that age are the greatest in the districts of the greatest mortality. In Liverpool, for example, where the mean age of death is about 18 years, the mean age of the living is 25 years; and whilst in Herefordshire, where the mean age of death is 39 years, the mean age of the living is between 28 and 29 years. This topic, however, appears to be entirely open to investigation.

Successful investigation must be conducted *in situ*, and by the examination of particular cases, in which returns are to be ~~printed~~. So far as examination has yet proceeded, wherever one part of the population, or one part of a class of the population, have been located for a length of time in undrained, uncleansed, filthy, and badly ventilated abodes, it is certain that amongst that population will be found a low mean age of death, whatever may be their condition in respect to employment and wages. From the surrounding physical circumstances of the population, if bad, a low average of death, if good the contrary, may with certainty be predicted, whatever may be the age of the living population, its increase, or decrease, or general movement. The mean age of death is found in most steady coincidence with the physical of all other circumstances. The effects of morbid miasma, or the pressure of common causes of disease, are manifested immediately on all surrounding human life, (and there is evidence to believe they are manifest in their degree on animal life,) in its several stages, in proportion to the relative strength of the destructive agents, and the relative strength or weakness of the beings exposed to them; the effects are seen first on infants; then on children, in the order of their age and strength; then on females, or on the sickly, the aged, and feeble; last of all, on the robust workmen, and on them it appears on those parts of the body that have been previously weakened by excess or by illness.

This is not the occasion for exemplifying at length the practical errors that arise in the matter of insurance from the neglect to verify at every step the facts, and from substituting hypothesis and assumed data for actual observations. But I may observe, that in the habits, modes of living, and general circumstances of the gentry and professional persons throughout the country, there is a closer coincidence than perhaps amongst any other class. Nearly all the returns that have been taken, show a coincidence of the mean ages of death, with these circumstances. The mean age of death of the class of gentry or professional persons, inclusive of their children, in towns is about 44 years; in the rural districts it appears to rise higher, and to be about 50 years. The Carlisle insurance table, which is deduced from the *former* experience of *the whole population* of a well-situated town, and which gives an expectation of 38·72 years of life at infancy, is a sufficiently safe basis of experience for the insurance offices, whose class of insurances consists chiefly of gentry and persons of the better condition. But when such tables are attempted to be applied, as they often are, to persons in other circumstances, the extensive ruin of benefit clubs attests the consequence.

The Northampton table, which gives an expectation of life of 25·18 years, might be safely applied to the inhabitants of the drained streets of Leicester, where the average age of death was 25½ years; but if applied as the basis of a society, to insure the casualties of mortality occurring in the undrained streets, where the average age of death was 17 years, the benefits or funds of the institution would be exhausted, and the society would be ruined eight years before its time. Any disturbance from immigration, or from an increase of births, would probably only avert the ruin for a year or two. The consideration of the necessity and value of actual observation I deem the more necessary, in consequence of a form of tables, founded on assumed radixes and hypothetical adjustments, which have occasioned much embarrassment in Germany, having been lately proposed for adoption in this country. The hypothesis on which these tables are formed may be thus stated:—If in 1000 persons born in any country, 500 live beyond 40 years, that is the expectation of life of that population, because at birth it is an equal chance to every one whether it attain 40 years or not. But the fallacy of this hypothetical basis may, I apprehend, be as shortly illustrated by another hypothesis. Suppose that of the 1000, 500 died immediately after birth; that the other 500 lived to attain 40 years, and were immediately cut off. According to the hypothesis, the expectation of life would be 40 years, although the actual mean number of years they all lived was only 20 years. No table of life is, I submit, to be depended upon which gives the population an expectation of life beyond what they actually do get; and what they actually get must be ascertained not by hypothesis, but from trustworthy registries. On the assumed radixes, and by the formula above stated, the expectation of life in the Metropolis is made to be 40 years, in the face of the fact, that by the registries they actually attain less than 30 years. The tables of Mr. Milne's own construction do not agree with the hypothesis; for example, the expectation of life deduced from the years is, by the Carlisle table, 38·72. If it were made up from the period when half the lives on which the table was formed had died, it would have been 41. But in nearly all other tables than his own the difference is wide indeed: for example, by Duvillard's table, which gave 29 years' expectation of life at infancy, but half were dead at 20; by the Montpelier table, which gave 27 years' expectation of female life at infancy, half were dead at 5 years; and for males the expectation of life was 23 years at infancy, whereas half were dead at 4 years. And the new table of mortality prepared by the chief actuaries in the metropolis on the experience of their several offices, and which, commencing at ten years, gives for males and females an expectancy, at 10 years, of 48 years; but it appears that as half the number die at 63, the difference, at this period, is 15 years! Of the 11,650 lives on which the Northampton table was founded, 5735 only, or the half, were living at the expiration of eight years from the year of birth; eight years was therefore, on the hypothesis, the expectation of life; but the years of life actually divided amongst the whole town was 25½ years. A society granting to such a population as that from which this experience was deduced, allowances of yearly payments, or annuities at birth, on the hypothetical deductions of expectation, would on the actual experience be ruined by obligations of payment of nearly three times the extent of those for which funds would probably be provided.

For many public purposes I have submitted it as a desideratum that population returns should give not merely the *numbers* of each class, or of those engaged in each distinct occupation, which only enables us to resort to the fallacious standard of the proportionate numbers of deaths, to judge of the mortality incidental to the class, but the total ages of each class, which would serve as an index of alterations in the sanatory condition of that same class. Such returns of the total ages of the living (as well as of the dying) should, for the public use, be reduced in the returns to their simplest proportions. In the form in which the returns of ages are at present given they appear to be useless to the public. I am unaware of any reference ever being made to them for any purpose. How many persons will be at the trouble of examining two columns of figures, without any aid, to compare the proportions of persons living in different communities? When the public are told that the deaths in London are 1 in 40 per annum, and in Paris 1 in 20, they have some standard of comparison, though, as I have shown, a very erroneous one. But what means have they of judging of the relative strength of populations, not by numbers merely, the units of which may represent infants, but the ages of the living? I am unaware of the existence of any means having been hitherto given of making such a comparison readily and correctly. The Commissioners of the last census give, as their predecessors gave, the ages in quinquennial periods. To take the first, the numbers living under 5 years of age. In attempting to deduce the average ages of every individual living in the community, what evidence is there to show that the great bulk of those living under 5 years of age are not in any one place infants in arms,—a fact which might make an important difference in the average; and so with each period? In order to get out some simple proportion, we are driven, in the absence of ~~any~~ information, to take the mean between the two numbers; and presuming that $2\frac{1}{2}$ may be taken as the average ages of the living under 5 years, to get the total number of years multiply the number living by $2\frac{1}{2}$.

To make returns of ages, whether of the living or dying, useful to the public, without inaccuracy, I propose, as a general rule, that no such returns shall be received without the years of every individual included as living, or as having died being included, the average age of the individual being obtained simply by dividing the total numbers of years by the total numbers of the individuals included. Every person would thus be furnished with a useful standard of comparison. Deduced, as well as they can be, from returns of ages in quinquennial periods, I find that the average age of all who lived in London, at the time of the last census, was 25 years, and is now 26 years and two months. In these facts, as exhibited in the simple proportions, all may understand something of the movement that has taken place; without them the columns of figures are to the majority of persons impenetrable fogs. If the simple proportions were given, the public would be enabled, by such returns, to make comparisons between district and district, and to judge of the relative degrees of pressure, in each, of the causes of mortality. As the simple proportions of average ages of the living have not yet, that I am aware of, been used, or even calculated in any instance, I beg leave to exemplify them.

Mr. Griffith Davies is theoretically of opinion, on a formula of De Moivre, that in general the average age of death in any community is

neeessarily higher than the average age of those living in the same eommunity: and that in a stationary population the average age of death will, under ordinary eireumstances, be in the ratio of 3 to 2 higher than the average age of the living. I have had the average age of the living population, on whieh the experienee embodied in the Carlisle Insuranee table was founded, ealculated: and if that may be eonsidered to have been a stationary population, the proportion of the ages of the living to those of the dying was praetieally as about 3 to 4: for whilst the average age of the dying was $38\frac{3}{10}$, the average age of the living population was $32\frac{9}{10}$. The average age of the dying in Hereford, in which the inerease of population had been very slight, was 39. But the average age of the living population, so far as it ean be made out from quinquennial returns, was 28 years and 5 months. On this and all returns of the ages of the living, in the mode in whieh the returns have been colleeted, allowanee must be made for under-statements of ages by some of the adult members of the eommunity. On the whole, the proportion of the ages of the living to the dying appears to be, in an ordinarily healthy and stationary eommunity, as about 3 to 4.

As yet the observations have not been on a suffieiently wide basis; but it appears that wherever there is any divergenee between the average ages of the living and the average ages of the dying, the divergence beyond their natural proportions may be taken as indieating the proportionate operation of some disturbing eause upon either line; as by some extraordinary inerease of births, or by immigration or emigration, on the average ages of the living, and on the line of the average ages of the dead.

So far as I have been euabled to observe or colleet from the extremely imperfeet data at present available to the publie serviee, the line of the average ages of the living is eomparatively steady; the disturbanees by migration and immigration whieh often compensate eaeh other, for the same plaee and period, being mueh the same at different periods, and seldom affeet the results materially, whilst the variations in the pressure of the eauses of death from year to year are usually eonsiderable, and warrant the assumption that in general the disturbances oeeasioning the divergenee deseribed, are from the operations of eauses of death upon that line. Wherever the pressure of the eauses of death has yet been observed to be very great, there the line of mortality, or the average age of death, is below what may be ealled the line of vitality eonstituted by the average age of the living; and wherever there is on the whole any diminution of those eauses of death, as by better ventilation, or by widening streets, opening new thoroughfares, better supplies of water, sewering and cleansing, and improvements in the general habits of the population, there the line of mortality, the infantile mortality espeeially, diminishes, the average age of eaeh adult elass, up to sexagenarians or oetogenarians, inereases, and the average age of death aseends above the average age of the living. The means of observation are as yet too few to elieit more than indieations for the guidance of sustained investigation, to determine whether the divergenee of the two lines may be redueed to any rule.

In Liverpool,—where the investigations into the condition of the resident eellar population eertainly show an inerease of the eauses of death, —over erowding, defeetive ventilation, bad supplies of water, and inereased filth,—the average age of death is, for the whole town, 17 or 18 years only, whilst the average age of the living population, so far as it

ean be made out from the mode in whieh the eensus is prepared, is 25 years. As far as ean be aseertained, by referenee to previous registers of one large parish, where the ages of the dead were formerly entered, the average duration of life in that town has gradually fallen. The average ages of all who were buried in St. Nieholas parish, between the years 1784 and 1809, was 25.

In Manehester, the average age of the living is 25 years, but the average age of the dying is only 18. In Leeds, the average age of the living is also 25 years, but the average age of the dying is only 21.

	Years.	Months.
The average age of all who *live* in the town parishes of Middlesex, so far as they can be made out from the only available materials,—the returns in quinquennial periods,—is only	26	2
But the average age of all who *die*, judging from one year's return, appears to be about	27	0

If, however, we allow for the under-statement of ages, the two lines for the whole metropolis would be nearly coineident. On the standard of Carlisle or of Hereford, the average age of death should be 12 years higher.

Arranging the several distriets of the metropolis, in the order of the average age of deaths, we find the average age of the living deerease in some proportion with the decrease of average age of the dying; and the proportion of births to the population inerease with the deerease of the average age of death. The exeess in the proportionate number of births beyond the proportions in sueh a eounty as Hereford (1 to 44), where the average age of death is much higher, and proportionate number of deaths to the population, afford important indieia.

Districts in which average Age of Death of the whole Population is	Average Age of Death in the District, of all Classes.	Average Age of all who live in the District.	Proportions of Births to the Population.	Proportions of Deaths to the Population.	Excess above County of Hereford in the Number of	
					Deaths & Funerals.	Births.
	Years.	yrs mon.				
Highest . . . (Comprising 2 Districts.) Population 120,678.	35	27 11	1 to 41	1 to 42	966	145
1. Intermediate . (6 Districts.) Population 311,022.	30	27 5	1 to 39	1 to 46	1,836	689
2. Intermediate . (12 Districts.) Population 774,937.	27	26 11	1 to 33	1 to 40	7,457	5,718
Lowest . . . (12 Districts.) Population 663,290.	23	26 5	1 to 30	1 to 41	5,795	6,822

It will be observed that in the least healthy distriets, where the pressure of the eauses of mortality is the most extensive, the average age of death falls nearly three years and a half *below* the average age of the living, whilst in the higher distriets the line of mortality rises towards the natural position, or nearly four years above it. But it must still be borne in mind, in the inspeetion of the returns from the highest district,

that the average is made up of districts which are probably retrograding, connected with others which are advancing, comprising streets, the connected courts and alleys from which are widely as separate and distinct in condition; and, if I may use such an illustration, as little appropriate for any average that could be represented by numerals—as were the conditions of Lazarus and Dives.

Even the lowest proportion of deaths to the population presented in the district returns, that of Hackney, where it is only 1 to 56, appears to be a proportion in excess by nearly one-eighth, *i. e.* the deaths from epidemics, as well as the excess of more than one-third in the deaths of children under 10 years of age. The return, from the healthiest district in the returns, of the average age of deaths, gives an average of 7 years' loss of life for the whole population ; whilst for the *adults* of the middle classes it gives 10 years, and for the *adults* of the working classes 7 years' premature loss of life. Even in the county of Hereford, where there is a proportion of deaths of 1 to 64 of the population, and the standard of the Carlisle table of insurance, where an average age of 39 years of death is attained, it will be observed that even this average includes a large proportion (542), or nearly 1-third in the number of deaths under 10 years of age, and 123 or 1-14th deaths from epidemics, besides others involving deaths from preventible causes. Only 329, or 1 in 5 of the deaths in this very healthy county, were deaths registered as from old age. By the removal of this excess of deaths, the excess of births which replace them would even in these districts be of course still further diminished.

It may be conjectured that if there were the means of distinguishing accurately the various classes of the living amongst whom these deaths fall, the irregularity of the proportionate number of deaths which probably arise amongst the labouring classes would be accounted for. The present returns of the number of births do not distinguish the classes amongst whom the births occur. Taking the districts in the order of the average age in which deaths occur to the labouring classes, and comparing the proportions of the deaths and funerals with the proportions which occur in Hereford, the excess of deaths and funerals was in 1839 as follows :—

Districts in which average Age of Death of Artisans, &c., is	Average Age of Death of Artisans, &c. in the Districts.	Excess in Number of Deaths of Artisans, &c., in the District above the Deaths of Agricultural Labourers in Herefordshire.
1. Highest number of the class (comprising 2 Districts,)	38	483
2. Intermediate (1) number of the class (5 Districts.)	27	548
3. Intermediate (2) number of the class (10 Districts.)	23	1,773
4. Lowest number of the class (15 Districts.)	20	4,121

The totals of the subjoined district returns for the metropolis are as follows :—

	Number of Deaths of each Class.			Number of Deaths from Epidemic Disease.	Average age at Death of all who die above 21.	Average age at Death of the whole Class, including Children.	Ratio of Deaths of Children to total Deaths.	Ratio of Deaths from Epidemic, Endemic, & Contagious Diseases to total Deaths.
	Adults.	Children under 10 years.	Total.					
Gentlemen	1,724	529	2,253	210	60	44	1 in $4\frac{3}{10}$	1 in $10\frac{7}{10}$
Tradesmen	3,979	3,703	7,682	1,428	51	25	1 in $2\frac{1}{10}$	1 in $5\frac{4}{10}$
Labourers	12,045	13,885	25,930	5,469	49	22	1 in $1\frac{9}{10}$	1 in $5\frac{5}{10}$
Paupers	3,062	593	3,655	557	60	49	1 in $6\frac{2}{10}$	1 in $4\frac{8}{10}$
Undescribed	2,996	2,761	5,757	1,051	56	28	1 in $2\frac{1}{10}$	1 in $6\frac{6}{10}$
Totals	23,806	21,471	45,277	8,715	53	27	1 in $2\frac{1}{10}$	1 in $5\frac{2}{10}$

In making up this table, all who were not distinguished as master tradesmen were entered as mechanics. This circumstance would give to the labouring classes an appearance of a higher average age of death than is gained by them. On the other hand, some of the labouring classes will be found to have died in the workhouse, which would perhaps keep the average where it now stands, whilst if the registration were more accurate the average age of death of the middle classes might be found to be about 27. The average age of death of 27 given for the whole metropolis is not made as an average of the averages, but from the average of the whole. The apparent high average of the age of death of paupers arises from the smaller proportion of children amongst them: and the larger proportion of aged adults who seek refuge in the workhouse.

The following totals of the mortuary registration of the several registrars' districts in Hereford for the same year are given for comparison:—

	Number of Deaths of each Class.			Number of Deaths from Epidemic Disease.	Average age at Death of all who die above 21.	Average age at Death of the whole Class, including Children.
	Adults.	Children under 10 years.	Total.			
Gentlemen	49	19	68	2	65	45
Farmers, &c.	205	45	250	14	60	47
Labourers	833	324	1,157	87	58	39
Paupers	26	11	37	1	71	51
Undescribed	124	143	267	19	68	30
Totals	1,237	542	1,779	123	60	39

The total number of births registered in the several districts in the metropolis, where it is yet far from complete, in the year 1839, was 51,232, or 1 to 37 of the population. The total number of births registered in Hereford during the same year was 2579, or 1 to 44.

The positions advanced in the Sanatory Report of the greater proportion of births in the districts where the deaths are the most frequent, is confirmed in respect to the metropolis by a more recent return with which I have been obligingly favoured by the Registrar-General, in which he shows,—

	Proportion per Cent.		Ratio of Deaths to Births.
	Deaths.	Births.	
" Unhealthiest sub-districts . .	3·14	3·66	1 to 1·17
Less unhealthy sub-districts. .	2·68	3·18	1 to 1·19
Average sub-districts . . .	2·43	3·35	1 to 1·38
Healthier sub-districts . . .	2·17	2·64	1 to 1·22
Healthiest sub-districts . . .	1·87	2·47	1 to 1·32

"The mortality is 68 per cent. higher in the unhealthy than in the healthy sub-districts: the proportion of births is 48 per cent. greater in the unhealthy than in the healthy sub-districts."

If the deaths in the metropolis during 1839 had been in the same proportion to the population as they were in Hereford, there would have been 8866 funerals less than there were during that year.

If the proportion of births in the metropolis during that year had been the same as in Hereford, there would have been 16,053 births less than there were.

Or to vary the illustration:—

If the deaths in Hereford had been in the same proportion as the deaths in the metropolis, the community in that county would during that year have had 977 funerals the more.

If the births in Hereford had been in the same proportion as in the metropolis, there would during that year have been 540 births the more.

If the deaths in the whole of England and Wales had been in the proportions attained in some districts, and attainable in all, namely, 1 to 50, there would during the year have been 31,866 funerals less, and more than ten times that amount of cases of sickness the less.

If the proportion of births in the whole kingdom had been the same as those occurring in average healthy districts—such as that of the town district of Hackney, for example, of 1 to 42—there would have been 139,958 births the less to make up for the excess of deaths.

The importance of the subject will justify the reference to other examples.

The Commissioners for taking the census of Ireland have bestowed considerable labour to effect various improvements, with a view to determine more accurately the actual condition and progress of the population. They have attempted, amongst other improvements, to ascertain not merely the total number of houses, but the number of each description of houses in each district. For the want of any system of mortuary or birth registry in Ireland their attempts to ascertain correctly the proportions of deaths and births to the population appear to have been to some degree frustrated; and the return of the average age of death must be received as an approximation, giving higher than the real chances of life in that country. From the mode which the Commissioners adopted, of collecting the ages of the living by taking the actual age of each individual with precautions, it appears probable that their returns on this head are more trustworthy than those obtained in England.

The proportions of births to the population obtained by the Census Commissioners in Ireland are, I conceive, below the real amount; the proportions of deaths are confessedly so. The proportions of deaths and several other results may however serve for comparison between one province and another, and between one county and another. I have taken

the following results from several of their tables, or have had them calculated from their data. I submit them as indications of the momentous public truths that still lie open for investigation, of which truths the most important are the extent of the operation of the causes of mortality, which can only be correctly ascertained on the spot by inquiries for a mortuary registration, by responsible officers of superior qualifications and intelligence as officers of health. The fractional numbers are omitted in the returns from the provinces.

	ULSTER.				LEINSTER.				MUNSTER.				CONNAUGHT.				IRELAND.			
	RURAL.		TOWN.		RURAL.		TOWN.		RURAL.		TOWN.		RURAL.		TOWN.		RURAL.		TOWN.	
	Houses.	Families.	Houses.	Families.	Houses.	Families.	Houses.	Families.	Houses.	Families.	Houses.	Families.	Houses.	Families.	Houses	Families.	Houses.	Families.	Houses.	Families.
1. First Class houses	1	1	10	9	2	2	24	33	1	1	12	14	·5	·6	7	10	1·3	1·4	15·4	21·
2. "Good farm-houses, or in towns houses in a small street, having from 5 to 9 rooms and windows"	21	21	56	60	21	21	37	39	13	13	14	49	8	8	30	33	16·8	17·2	43·6	46·6
3. "A better description of cottage, still built of mud, but varying from 2 to 4 rooms and windows"	45	45	23	21	47	46	23	16	34	34	30	25	39	39	36	33	41.9	41·7	26·8	21·7
4. "All mud cabins having only one room"	32	32	9	8	28	28	14	10	50	49	13	10	51	50	25	22	40·	39·7	18·7	10·7

	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.
Average age at death	31·8	32·	23·8	23·6	32·	31·5	25·	25·4	29·2	27·	23·6	23·7	26·1	24·3	22·6	22·4	29·6	28·9	24·1	24·3
	32		24		32		25		28		24		25		23		29		24	
	31				30				27				24				28			
Average term of premature loss of life as compared with the experience of Carlisle or the county of Hereford	7	15			7	14			11	15			14	16			10	15		
	8				9				12				15				11			
Annual proportion of births to the mean population	1 in 31·1				1 in 32·3				1 in 29·5				1 in 28				1 in 30·3			
Average age of all who lived in 1841	24				25				24				23				24			
Proportion of widows to every 100 of the population above 17 years old	12	15			13	17			12	16			12	17			12	16		
Rate of increase on population since 1831	4·36				3·35				7·59				5·58				5·25			
Excess in number of births to every 10,000 of the population above the proportion of births in Hereford	84				73				95				117				90			
Positive numbers of births in excess above the proportion of births in Hereford	20,003				14,515				22,875				16,624				74,016			
Proportion per cent. to total population of persons 5 years old and upwards who can read and write	24	40			26	45			21	36			13	31						
	26				30				23				14							
Proportion of crimes of violence or passion to each 10,000 of the population on an average of 8 years to 1842 — Murders and Manslaughters	·5				·7				1·3				·8							
Rapes and assaults to ravish	·2				·3				·4				·4							

The proportion of widowhood (which would generally be attended by its proportion of orphanage) to the short duration of life in the worst conditioned districts, is submitted as confirmatory of the principles expounded in the General Sanatory Report on the Condition of the Labouring Population in Great Britain, p. 188, *et seq.*

Perfect conformity of the rate of increase of population with the ages of the living and the dying was not to be expected in the returns where the emigration from the different provinces is (probably) variable; but in the two provinces where the household condition appears to be the

worst, and the proportion of mud cabins the greatest, there we find the mortality is the highest.

Where the pressure of the causes of mortality is the greatest, where the average age of death is the lowest, and the duration of life is the shortest, there the increase of population is the greatest. The proportion of children is great, because life is short and the generation transient; the middle aged and the aged are swept away in large proportions; and marriages are disproportionately early. But, says Mr. Macculloch in an essay or note in his edition of the "Wealth of Nations," in support of Mr. Malthus's original view, "The effect of wars, plagues, and epidemic disorders, those terrible correctives, as they have been justly termed by Dr. Short, of the redundance of mankind on the principle of population, sets its operation in the most striking point of view. These scourges tend to place an old country in the situation of a colony. They lessen the number of inhabitants, without, in most cases, lessening the capital that is to feed and maintain them." What I apprehend the actual facts when examined place in a striking point of view, is the danger of adopting conclusions deeply affecting the interests of communities, on hypothetical reasonings, and without a careful investigation whether the facts sustain them. The facts themselves, when examined, show that (be it as it may with war) epidemic disorders do *not* lessen the number of inhabitants; and that they *do* in all cases that have been examined lessen the capital that is to feed and maintain them. They lessen the proportion of productive hands, and increase the proportion of the helpless and dependent hands. They place every community, new or old, in respect to its productive economy, in the position which the farmer will understand by the like effects of epidemics upon his cattle, when in order to raise one horse two colts must be reared, and the natural period of work of the one reared is, by disease and premature death, reduced by one-third or one-half. The exposition already given, *vide* General Report, p. 176, *et seq.*, p. 200, of the dreadful misery and disease-sustaining fallacy which erects pestilence into a good, is further illustrated by the effects of the proportions of the dependent populations of Ireland. Thus, in England, the population above 15 and under 50 years of age in every ten thousand is 5025, and this five thousand have 3600 children below 15 years of age dependent upon them. In Ireland, the population above 15 years of age is 4900—in other words, there are 125 less of adults in every ten thousand; and this smaller proportion of living adults, with eight or ten years' span less of life or working ability, have 4050, or four hundred and fifty more children dependent upon them. In England there are 1365 persons in every ten thousand, or 13½ per cent. above 50 years old to exercise the influence of their age and experience upon the community. In Ireland there are only 10 per cent., or 1050 in every ten thousand of the population above 50 years of age.

It appears from a report which the Census Commissioners give on the sanatory condition of Dublin, that the mortality in the different localities of that city varies with their physical condition in the lower districts, and coincides with the description already cited in the general report, from the report of Dr. Speer, the physician to the Dublin Fever Hospital (*vide* General Sanatory Report, p. 96). The like consequences follow to the lower Irish population settled in the English towns with the like habits, which permit them to accumulate refuse round their dwellings,

and live in an atmosphere compounded of the miasma of a pigsty and a privy, and the smoke of a chimney in a crowded room.

Since these results have been published, I have received from Dr. James Willis, of Dublin, a benevolent physician, who has visited the dwellings of the lowest classes, and noted the ages of death in upwards of 12,000 cases, the valuable confirmation of the general conclusions above stated, derived from his extensive observations. He observes that "the census for Ireland gives a correct enumeration of the living, together with a very imperfect account of deaths, which is admitted to be very short of the actual number; yet are put forward 'to show cause why the deaths of Ireland should be, from the present condition of the country, independent of climate or other circumstances of that nature, *less than* those of England.' This is far from being correct; the very contrary is the fact. The mortality amongst our working classes is tremendous." He asks, "is it not horrible to contemplate an island producing as large a proportion of all animal life, as any on the face of the globe, having less of manhood and more of dependent infancy, than anywhere to be found, even in the manufacturing and mining districts of Great Britain!" He gives the following Table of—

The Proportionate Numbers of each Age in Ireland, compared with those in Leeds, Manchester, and Liverpool.

IRELAND, 1841.						Manchester, Leeds, and Liverpool.	
Ages.	Ulster.	Leinster.	Munster.	Connaught.	Total.	Ages.	——
5 and under	15·3090	14·3283	15·3826	16·1861	15·2464	Under 5	13·4053
6 to 10	13·4441	12·3361	13·0558	14·3064	13·2124	5 to 10	10·7092
11 — 15	12·6154	11·3729	11·5807	12·2628	11·9511	10 — 15	10·0235
16 — 20	11·4320	11·5496	11·6448	11·9118	11·6060	15 — 20	9·8328
21 — 30	16·0914	18·7697	18·6351	16·8483	17·6150	20 — 30	20·8821
31 — 40	11·2347	11·7352	12·0031	11·1488	11·5658	30 — 40	15·4189
41 — 50	8·4927	9·3316	7·8535	7·9648	8·4164	40 — 50	9·8329
51 — 60	6·0780	6·0808	6·1819	5·7881	6·0588	50 — 60	5·3327
61 — 70	3·2504	2·9086	2·3997	2·3644	2·7648	60 — 70	3·0155
71 — 80	1·5128	1·1493	·9454	·9073	1·1535	70 — 80	1·1205
81 — 90	·3928	·2990	·1992	·1872	·2773	80 — 90	·2322
91 —100	·0502	·0611	·0456	·0468	·0509	90 —100	·0199
Upwards	·0006	·0012	·0012	·0014	·0011	Upwards	·0020
Not specified.	·0952	·0759	·0701	·0748	·0797	Not specified	·1716
Population on which the per-centage is formed.	238·6373	197·3731	239·6161	141·8859	817·5124	Population	68·1524

In Manchester and Leeds the proportion of children will be increased by immigration to supply the manufactures. In Liverpool, the increase of population has been 34 per cent.; the average age of the living is 25 years. In Manchester, the increase has been 25 per cent.; the average age of the living is 24 years. In Leeds, the increase has been 19 per cent.; the average age of the living was 24 years and 5 months.

From inquiries made by Dr. Willis from cellar to garret, and from house to house in Dublin, he found the average age at death of the working classes was 18 years, decimal 65; which it will be seen is about

the same age as that in one of the lowest districts in London, Bethnal Green; it being in the best districts in London about 30. The average age of death of those of the working classes in Dublin who had attained 21, was no more than 34·70; whilst even in Bethnal Green it is not less, apparently, than 46.

Speaking of the deaths of children he states, "the deaths up to 5th year are rather under those of Manchester, Leeds, &c.; above 5 and up to 10, the mortality is very great, and more than in any of your manufacturing districts I wish to avoid all theory, yet I cannot resist endeavouring to account for this excess of mortality at the ages 6 to 10.

"The mothers with us have no employment, and, therefore, even in their wretchedness they bring up a greater proportion of infants, say up to 5th or 6th years; from this to the 10th year very many of our poor children have not the same comforts as your factory children, and therefore furnish a larger proportion of deaths."

"The average number of children baptized to each marriage, is 5·70; average number now living to each marriage, 2·67. Of mothers who have had eight or more children, only 1 in 718 never lost a child; of mothers who have had six or more children, only 1 in 215 never lost a child!"

The Census Commissioners of Ireland have endeavoured to obtain returns of the chief causes of the mortality; and it appears from the report upon them, that hitherto, notwithstanding all that has been said and written, that fever has returned nearly decennially in periods, irrespective of any general distress in that country, and has extended its ravages to classes who were exposed to the miasma, but who suffered no distress. "Cases of starvation," it is stated, "have been registered from returns at almost every age; 79 of them took place in the rural district, or 1 death in 11,539 of the general mortality of the open country, and minor towns and villages; 18 in the civic, or 1 in 13,009 of the deaths in towns of or above 2000 people; and 20 occurred in hospitals; the patients having been admitted when suffering from want of food, or in such a destitute condition as subsequently produced death from exhaustion. Including the deaths in hospitals with those in the civic districts, to which they properly belong, it appears that the deaths from want and destitution in the larger towns have been 1 in 7240 to the total mortality of these places. During the first 5-year period, these deaths were on an average but 6 per annum, and in the last 5-year period (that ending June, 1841), they had increased to the yearly average of 18."

The dependency of the duration of life upon the physical condition of the population, and the connection of several classes of moral and economical facts, with the proportionate mortality, may be further exemplified; taking the four counties in Ireland, in which the proportions of mud hovels are the greatest; and the four counties in which the proportions of such tenements are the least.* Having obtained these proportions, I directed the other returns to be obtained in their order, and confidently anticipated the general results, following from the facts indicative of the physical condition of the population. I now adduce these results, physical and moral, as additional proofs and exemplifications of the conclusions stated in pp. 128 and 129, and other parts of the Sanatory Report.

* The county of Dublin is left out as having a disproportionate amount of suburban population.

	The four Counties where the average proportion of mud hovels, as habitations, is the lowest.				The four Counties where the average proportion of mud hovels, as habitations, is the highest.			
	Down.	Wexford.	Kilkenny.	Monaghan.	Kerry.	Mayo.	Clare.	Cork.
Proportion per cent. of families occupying habitations which are mud cabins having only one room	24·7	29·4	30·9	31·5	66·7	62·8	56·8	56·7
			29				61	
Proportion of deaths from epidemic disease to every 10,000 of the population	36	28·5	36·8	40·4	50·2	51·0	53·1	43·3
			35·5				47·8	
Average age of all who have died during the 10 years ended 6th June, 1841	33·6	34·10	33·2	31·4	24·10	23·2	24·5	28·8
			33·4				26·8	
Average age of all the living in 1841	24·10	25·10	24·8	24·2	23·1	25·0	22·9	24·0
			24·11				23·5	
Proportion of births to the population	1 in 33·4	1 in 34·3	1 in 33·6	1 in 32·5	1 in 28·8	1 in 28·0	1 in 28·7	1 in 31·8
			1 in 33·4				1 in 29·9	
Increase per cent. of the population since 1831	2·7	10·6	7·9	2·5	11·7	6·2	10·9	9·9
			5·0				8·7	
Per cent. of the population, 15 years and under	39·7	36·6	37·8	40·9	42·4	43·1	42·4	39·7
			38·8				41·9	
Above 50 years	12·0	12·5	10·9	10·9	9·4	9·4	8·7	10·4
			11·6				9·5	
Proportion per cent. of male and female population, 17 years and upwards. Unmarried	42	44½	45½	41	37	36	40½	42
			43¼				39	
Married	49	47	45½	49½	55	56	51½	50
			47¾				53	
Per cent. of the population 5 years old and upwards, who can neither read nor write	27·5	41·3	51·2	51·3	70·4	79·0	63·1	65·6
			42·8				69·7	
Proportions of crimes * of violence or passion to each 10,000 of the population on an average of 8 years to 1842:—								
Murders and Manslaughters — Proportions	·11	·20	·44	·55	·71	·87	1·08	·52
Murders and Manslaughters — Positive Numbers	34	35	83	88	166	271	249	316
Proportions			·32				·72	
Rapes and Assaults with intent to commit — Proportions	·06	·15	·22	·35	·71	·51	·46	·28
Rapes and Assaults with intent to commit — Positive Numbers	15	22	34	58	166	159	108	178
Proportions			·17				·44	

* By my colleagues and myself, the uncertainty of the returns of commitments, or of convictions, as data to judge of the amount of crime committed in any district, was demonstrated in § 1 to § 4 of our Report as Commissioners of Inquiry into the Condition of the Constabulary Force in England and Wales; but that uncertainty attaches perhaps in the least degree to the higher classes of crimes.

The general sanatory condition of the population of Scotland, and the pressure of the preventible causes of death, appears to be lower than in England, and higher than in Ireland; and so it appears, from the recent census, is the average age of the living.

It may be conceived that the low average age of the living in these cases is ascribable mainly to an increasing proportion of children incidental to an increasing population. Not so, however: the average age of the living is more powerfully influenced by disturbing causes affecting the population of adults, each with accumulated years, than by causes affecting the infantile population. One adult of 50 years added to the living is equal to the addition of 50 infants, and so with the average ages of deaths. The average ages of the living appear to have increased and not diminished with the increasing population. Be the sanatory condition of the poorest classes and the amount of disease and death what it may, as compared with former periods, (and there is direct evidence that it is in populous districts increasing,) there has been some improvement in the residences of the middle and higher classes; household drainage and cleanliness has, in some districts, been improved; the quantity of town and land drainage, and cultivation, has of late increased in various proportions in each country; and the decrease in the causes of mortality appears to have been followed by an increase of the average age of the living, of particular classes at the least, sufficient to present an increase, though a dreadful slow one, in the average age of the adults living. The increase of population, as usually given in census returns only in numero, may have been an increase in number of deteriorated pigmies: the increase in the ages of the living in simple proportions would give the most valuable information. The increase of the proportions of age and of adults is simply represented as follows:—

	England.		Ireland.		Scotland.	
	1821	1841	1821	1841	1821	1841
Per-centage of Population of 15 Years and under . . .	39·09	36·07	41·06	40·44	41·0	36·0
Over 15 Years . .	60·91	63·93	58·94	59·56	59·0	63·6
	Yrs. M.	Yrs. M.	Yrs. M.	Yrs. M.	Yrs. M.	Yrs. M.
Average age of each living individual .	25·3	26·7	23·7	24·0	25·1	25·9

The Irish census affords materials for the belief that statistics may be much extended, so as to embody economic facts which are further illustrative of the economical condition of the country. I will endeavour shortly to exemplify them.

On an inquiry as to the condition of the agricultural population, it was found that the land occupied by large masses of them, is in such small patches, as to preclude the application of capital, to preclude the first step to sanatory as well as productive improvement—thorough drainage, to preclude rotation of crops, the application of various manures, of machinery, and almost to necessitate a systematic misapplication of labour at all times, and to leave the owner or labourer in a state of idleness. The agricultural portion of the Irish census shows that upwards of 40 per cent. of the farms in Ireland are from 1 to 5 acres only; 35 per cent. from 5 to 15 acres; 13 per cent. from 15 to 30; and only 7 per cent. of those about 30 acres. Now the following facts were elicited in the course of some official investigations in Ireland, by

Mr. Muggeridge. The particulars which this evidence indicates, might perhaps be reduced to a statistical form.

"It was once endeavoured to be explained to me, that the comparative lowness of condition of the Irish peasantry arose from a fact that might not have been brought before me, viz., that an Irishman's year has but 200 days! I confessed the proposition was novel to me, and my informant thus logically, and as he considered unanswerably, demonstrated it: You will allow, said he, an Irishman has 52 Sabbaths in which he should not work? Granted. There, then, is 52 days. Not an Irishman in the county Armagh that does'nt attend, at least, one market weekly; there go 52 more days. Find an Irishman, if you can, that does not attend one fair a month; there go 12 more days. Where is the man, if he be at all respectable, that won't devote his afternoon or half day to the wake or funeral of his friend or neighbour: and it is a poor neighbourhood that there won't be a death in a week; there go 26 days more. Then, you know, there are our Saints days, our holydays, our birthdays; and may be Dan will be getting up a precurshin maiting, or the likes o' that, which a man is bound to attend, for the love of Ould Ireland. And now make your reckoning, and see whether a man will have more than 200 days in a year he can call his own.

"There is, I fear, too much of fact in this exquisitely simple and unsophisticated narrative; and much time is lost in the market and the fair, and elsewhere, which, applied to industrial pursuits or objects, would go far to ameliorate the condition of the people. Much of this inertness, or idleness, may unquestionably be ascribed to the low and inadequate rate of wages in Ireland; and to labour mostly being remunerated by a standard too low to call forth those incentives to industry and good workmanship, which are induced by a liberal, or even a fair scale of payment. Hence it is, though paradoxical it may seem, that cheap labour is dear labour, the lack of motive to work will impair the value and efficiency of the labour rendered; and the slovenly and careless manner in which, under such circumstances, work is performed, too often makes it almost valueless to the employer, and as a natural consequence, rarely to be repeated."*

From the evidence already yielded by vital statistics, it will be seen, that the poor Irish peasant, or town labourer, after having escaped the nearly equal chances of infantile mortality, has the productive years of his life, and self-supporting ability, reduced eight or ten years, or nearly one-fourth below the average duration of an agricultural labourer in a healthy English county. From such evidence as that last cited, it will be seen that the Irish peasant has the productive days of his years reduced by nearly one-third, and moreover, from other evidence, (*Vide* Reports of the Agricultural Assistant Commissioners on the Poor Law Inquiry,) it will be seen that the efficiency and value of the hours of his days, of beneficial labour are reduced to nearly one-half, by circumstances which impair and prevent the advantageous application of those energies, which are developed so well, and so productively to himself, in increased wages, when working under more systematised direction in other countries: and finally, from the examination of the census enumeration of ages and the proportions of helpless children, of widowhood, and it is to be presumed of dependent orphanage, it may now be seen to how much

* Report of R. M. Muggeridge, Esq., on the Condition of Hand-loom Weavers, page 726, Part III.

greater extent than in England, the reduced produce, of his reduced hours, and days, and years, has to be divided for the support of the larger proportion of dependant hands, all produced by the heavier pressure of the preventible causes of sickness and mortality. When the range of facts and the conclusions thus developed is duly regarded and estimated, it will be seen how subordinate are the subjects of common declamation as "condition of the people questions" to that of their sanatory condition, even when viewed simply as an economical question of production. Amongst other questions in which a part of the range of statistical evidence throws light, *i. e.* the statistics of the size of the various holdings of land in Ireland, one question is that of fixity of tenure, and it is shown that if by fixity of tenure, is meant fixity of the holdings of all the miserable patches of land held and cultivated separately, the consequence must be the fixity of such hovels and of the habits and poverty entailed by such holdings; that is to say, the fixity of an enormous amount of misery and of a wretched population in perpetuity.

Let me now direct attention to another field of inquiry, differing largely in the amount of productive employment, in institutions, and in most other respects, excepting the chief physical circumstances which govern the sanatory condition of the population.

In abundance of employment, in high wages, and the chief circumstances commonly reputed as elements of prosperity of the labouring classes, the city of New York is deemed pre-eminent. I have been favoured with a copy of "*The Annual Report of the Interments in the City and County of New York for the Year* 1842," presented to the Common Council by Dr. John Griscom, the city inspector, in which it may be seen how little those circumstances have hitherto preserved large masses of people from physical depression. He has stepped out of the routine to examine on the spot the circumstances attendant on the mortality which the figures represent. He finds that upwards of 33,000 of the population of that city live in cellars, courts, and alleys, of which 6618 are dwellers in cellars. "Many," he states, "of these back places are so constructed as to cut off all circulation of air, the line of houses being across the entrance, forming a *cul de sac*, while those in which the line is parallel with, and at one side of the entrance, are rather more favourably situated, but still excluded from any general visitation of air in currents. As to the influence of these localities upon the health and lives of the inmates, there is, and can be, no dispute; but few are aware of the dreadful extent of the disease and suffering to be found in them. In the damp, dark, and chilly cellars, fevers, rheumatism, contagious and inflammatory disorders, affections of the lungs, skin, and eyes, and numerous others, are rife, and too often successfully combat the skill of the physician and the benevolence of strangers.

"I speak now of the influence of the locality merely. The degraded habits of life, the filth, the degenerate morals, the confined and crowded apartments, and insufficient food, of those who live in more elevated rooms, comparatively beyond the reach of the exhalations of the soil, engender a different train of diseases, sufficiently distressing to contemplate; but the addition to all these causes of the foul influences of the incessant moisture and more confined air of under-ground rooms, is productive of evils which humanity cannot regard without shuddering."

He gives instances where the cellar population had been ravaged by fever, whilst the population occupying the upper apartments of the same

houses were untouched. In respect to the condition of these places, he cites the testimony of a physician, who states that, "frequently in searching for a patient living in the same cellar, my attention has been attracted to the place by a peculiar and nauseous effluvium issuing from the door, indicative of the nature and condition of the inmates." A main cause of this is the filthy external state of the dwellings and defective street cleansing, and defective supplies of water, which, except that no provision is made for laying it on the houses of the poorer classes, is about to be remedied by a superior public provision.

	Years.	Months.
The average age of the white population living in New York, according to the Census, is	23	3
But the average age of all who die there is only. . .	20	0

Thus we have an excess of deaths over the ages of the living of more than three years and three months; denoting, if the like excess prevailed from year to year, an increasing pressure of the causes of mortality. If the mortality be the same from year to year, the chances of life would appear to be lower in New York than in Dublin, where, according to the data given by the Census Commissioners, it is 25 years 6 months.

In America little attention and labour appear to have been bestowed in any of the rural districts on general land drainage. Yet nature inflicts terrible punishment for the neglect of the appointed and visible warnings and actual premonitory scourges, amongst which are the mosquitoes and the tribes of insects that only breed in stagnant water and live in its noxious exhalations. The cleansing and the general sanatory condition of the American towns appear to be lower than in England or Scotland, whilst the heat there at times is greater, and decomposition more active; pestilence, in the shape of yellow fever, ague, and influenza, is there more rife; the deaths in proportion to the population more numerous, and the average age of death (so far as there is information) amongst the resident population much lower.

	Years.	Months.
The average age of the whole of the living population in America, so far as it can be deduced from the returns at the periods given in the Census, is only . .	22	2

Notwithstanding the earlier marriages, and the extent of emigration, and the general increase of the population, the whole circumstances appear to me to prove this to be the case of a population depressed to this low age, chiefly by the greater proportionate pressure of the causes of disease and premature mortality. The proportionate numbers at each interval of age, in every 10,000 of the two populations, are as follows:—

	United States of America.	England and Wales.
Under 5 years	1744	1324
5 and under 10	1417	1197
10 ,, 15	1210	1089
15 ,, 20	1091	997
20 ,, 30	1816	1780
30 ,, 40	1160	1289
40 ,, 50	732	959
50 ,, 60	436	645
60 ,, 70	245	440
70 ,, 80	113	216
80 ,, 90	32	59
90 and upwards	4	5
	10,000	10,000
Average age of all the living	22 years 2 months	26 years 7 months.

Here it may be observed, that whilst in England there are 5025 persons between 15 and 50, who have 3610 children or persons under 15; in America there are 4789 persons living between 15 and 50 years of age, who have 4371 children dependent upon them. In England there are in every ten thousand persons 1365 who have obtained above 50 years' experience; in America there are only 830.

The moral consequences of the predominance of the young and passionate in the American community are attested by observers to be such as have already been described in the General Sanatory Report as characteristic of those crowded, filthy, and badly administered districts in England, where the average duration of life is short, the proportion of the very young great, and the adult generation transient.

The difference does not arise solely from the greater proportion of children arising from a greater increase of population, though that is to some extent consistent with what has been proved to be the effect of a severe general mortality; the effects of the common cause of depression is observable at each interval of age; the adult population in America is younger than in England, and if the causes of early death were to remain the same, it may be confidently predicted that the American population would remain young for centuries.

	Years.	Months.
The average age of all alive above 15 in America is .	33	6
The average age of all alive above 15 years in England and Wales is	37	5
The average age of all above 20 years in America is .	37	7
In the whole of England the average of all above 20 years is	41	1

The difference at the different stages of age appear also to prevail in proportion to the different pressure of the causes of disease and mortality in different districts in England: *e. g.* In the town parishes of Middlesex the average age of the living above 15 years is 35 years and 10 months; but in Hereford it is 39 years and 2 months. In Middlesex the average age of the adult population, that is of all above 20 years, is 38 years and 8 months; whilst in Hereford it is 42 years and 1 month.

Since these observations were written I have been favoured with a table of the mortality at the different ages of life in Philadelphia, from the year 1830 to 1842, inclusive, from the Board of Health of that city. Travellers, misled by the fallacious assumption of the proportions of death to the population, (a fallacy exemplified in the table itself,) which have ranged from 1 in 33 to 1 in 47, have represented this as a healthy city. It was formerly excessively ravaged by fevers. It has been greatly improved by the introduction of water, and the mortality has been diminished; but it is ill-drained. It is situated, like the worst town districts in England, amidst privies and cesspools, and in other respects its sanatory condition is inferior. In summer the heat is intense, decomposition active, and there is an excessively severe mortality. The infantile mortality appears to be as great as in the lowest districts of Dublin. It will be seen, in the subjoined table, that 50 per cent.—half who are born—die on the average before the fifth year of age. On the proposed hypothetical modes of preparing life tables, the expectation of life in that city to all born would be only 5 years; but the actual mean of existence is 20 years and 7 months to all who die.

MORTALITY IN PHILADELPHIA.

Population in 1830, 167,811; in 1840 (within the limits of the "health laws"), 232,000.

YEARS.	DEATHS.																	Average Age of Death of all who died.	Average Age of Death of all who died above 20 years.	Proportion of Deaths to Population assuming increase of Population to have been regular from 1830 to 1842.	Proportion of Births to Population presuming the increase to have been regular from 1830 to 1842.
	Under 1 Year.	From 1 to 2	2 to 5	5 to 10	10 to 15	15 to 20	20 to 30	30 to 40	40 to 50	50 to 60	60 to 70	70 to 80	80 to 90	90 to 100	100 to 110	110	Total.				
																		Years Months	Years Months		
1830	1305	325	260	139	75	99	508	518	353	267	195	100	70	24	2	..	4240	24 11	49 1	1 in 40	1 in 22
1831	1439	444	441	217	74	123	495	559	380	278	220	145	91	30	3	..	4939	21 9	45 6	1 ,, 35	1 ,, 24
1832	1083	530	533	299	109	127	687	705	509	327	261	168	59	14	1	..	5412	23 6	43 6	1 ,, 33	1 ,, 25
1833	1337	375	321	131	78	103	531	534	362	243	185	141	79	17	3	..	4440	22 2	44 3	1 ,, 42	1 ,, 24
1834	1578	442	385	168	81	130	559	547	394	279	244	149	91	21	5	..	5073	21 9	45 3	1 ,, 38	1 ,, 26
1835	1679	655	777	321	88	114	480	487	360	222	187	175	96	18	7	..	5666	18 1	45 11	1 ,, 37	1 ,, 27
1836	1496	412	508	210	73	124	575	638	477	295	242	182	99	22	4	..	5357	22 7	45 3	1 ,, 39	1 ,, 28
1837	1549	544	500	227	76	111	523	509	403	246	226	187	76	19	6	..	5202	20 8	45 8	1 ,, 41	1 ,, 26
1838	1728	635	543	223	77	119	532	497	363	234	207	201	78	22	3	..	5462	19 3	45 7	1 ,, 40	1 ,, 28
1839	1709	589	510	206	51	96	490	447	312	222	216	161	87	14	3	..	5113	18 10	45 9	1 ,, 44	1 ,, 31
1840	1531	435	424	193	81	114	496	501	372	270	232	168	106	19	7	..	4949	21 10	46 7	1 ,, 47	1 ,, 33
1841	1729	665	334	231	79	135	564	507	376	259	235	228	105	18	5	..	5470	20 11	46 5	1 ,, 44	1 ,, 29
1842	1778	665	637	304	91	118	530	558	363	295	249	217	116	20	1	1	5943	19 11	46 8	1 ,, 41	
Average Annual Number of deaths at each Period during the ten years ended 1842	1611	542	494	221	77	116	528	522	378	256	222	181	93	19	4	..	5267	Average age of Death for the ten Years ended 1842	Average Age of Death of all who died above 20 years of age during the ten years ended 1842.		
Proportion per cent of Deaths at each Period to Total Deaths on an Average of ten years ended 1842	31	10	9	4	1	2	10	10	7	5	4	3	2	4	1			20 7	45 9		

Note.—As it is uncertain whether the population for 1830 was given for the same limits, which apparently do not comprehend all the county as well as the city, the two last columns of the proportions of deaths and births to the population must be taken as subject to errors before 1840.

Of the 46 per cent. who die after 20 years, no less than 27 per cent. die under 50 years of age. It will be evident that these ravages of the adult population, in the prime of life, must keep down the age of the whole population. The mean age of the living of the whole white population of the city and county of Philadelphia in 1840, was only 23 years and 7 months, and of the adult population, above 20 years, only 36 years and 5 months. The average of all who die above 20 years of age in that city, appears to be 45 years; in London it is 53 years. Even in Bethnal Green, the lowest district, it is 48 years and 9 months.

The comparative amount of disease and death elsewhere, it need scarcely be said, in no way affects the positive amount of evil in this country, or dispenses with the duty of adopting such practical measures as may be preventive of a single one of the cases of preventible deaths which abound in masses in the large districts having the least unfavourable averages.

The instances have been adduced to exemplify the suggestions of amendment in the mode of measuring the amount and influence of mortality, and more especially to show the importance of giving the average age, as well as the numbers of deaths and the average age of the living, in each class of the community.

The subsequent district returns and the notes extracted from the reports made by the local registrars to the Registrar-General, in corroboration of the General Sanatory Report, will show the immense importance to the community of the facts that require investigation. It cannot be too urgently repeated that it is only by examinations, case by case, and on the spot, that the facts from which sound principles are deduced may be correctly distinguished. They can only be well classed for general conclusions and public use, by persons who have large numbers brought before their actual view and consideration, and who have thus brought before them impressively the common circumstances for discrimination, which no hearsay, no ordinary written information, will present to their attention. The attainment of this immensely important public service might properly have been submitted as a principal, instead of a collateral object, to the improvement of the practice of interment, for the appointment of such a small well-qualified agency as that proposed, of some five or six trustworthy officers of public health for each million of a town population, with the requisite powers and responsibilities for ascertaining the actual amount of the preventible causes of death, and informing the local officers and the public of what is to be done for their removal.

The several modes herein proposed, of rendering vital statistics useful and popular; of ascertaining the pressure of all the complicated causes of death; of determining how much is due to locality, how much to physical circumstances that are removeable, how much to social position; what is the actual amount of life experienced in years under these different circumstances; what is the progress of population under them, and what collateral moral results are measurable by statistical evidence;—these I would submit to the examination of the Fellows of the Society, and would especially ask the consideration of them by the great promoter of statistics in modern times, Mr. Quetelet, of Brussels. Much may be expected from the examinations of such competent investigators as I know are directing their attention to these subjects in the United Kingdom, viz., Dr. Laycock, of York; Dr. Playfair, Dr. Noble, Mr. Roberton, and others in Manchester; Dr. Duncan,

of Liverpool; the Rev. Mr. Clay, at Preston; Mr. Hawksley, of Nottingham,—in aid of the important practical investigations now in progress under the men of distinguished scientific qualifications, acting as Commissioners under the Health of Towns Commission;—by Dr. James Willis, of Dublin; and Dr. Griffin, of Limerick. Abroad there is much new investigation on these subjects. M. Ducpetiaux informs me he is endeavouring to obtain for Brussels a Report on the vital statistics and state of the population, similar to those given in the Sanatory Report.

I was informed by Dr. Sigmund, the imperial physician of Vienna, who was recently in this country, that the paternal government of Austria is now directing its attention to the subject of the waste of life amongst the lower classes, and the means of the improvement of their sanatory condition, and much may be expected from the zealous services of the medical staff, and of such officers as himself and Dr. Becher, and Mr. Czernig. The King of Prussia (who I learn from one of his officers, Dr. Julius, takes a special interest on the subject) has gone at once to the chief remedies, by the appointment of a commission to consider of the best means of improving the sanatory condition of his capital, by a better system of drainage, and by better supplies of water. Since these important steps have been taken the attack of his Queen by an epidemic disease has shown that the guards of palaces cannot exclude the morbific miasma that arises in the greatest strength in the worst-conditioned districts and assail all ranks of society. Such well-considered statistical mortuary returns as Dr. Wagner and Mr. Hoffman of Berlin might furnish, would show its citizens how much, by expenditure in well-executed measures, directed by engineering science, they may gain in the reduction of existing pecuniary burdens alone, that are entailed by an excessive mortality. It yet remains to be seen which government will take the lead in measures of improvement of the physical condition of the population, and the reduction of the mass of human misery.

On one large measure, the prevention of the burial of the dead in churches or in towns amidst the living, the steps taken at Franckfort, in Munich, and the chief towns of Bavaria; in Berlin, and the chief Prussian towns, and in Austria, the administrative arrangements for carrying out that measure, and for consulting the feelings of the lowest classes, and alleviating the painful mental associations with the general doom, and the wise collateral measures for giving security, it will be found, on examination, have no parallel in administrative measures in this country, in France, or in America; though hopes may be expressed that they are not beyond the reach of imitation in these countries. The communication from Dr. Griscom, of New York, and the application for reports and information from benevolent and influential persons in other American cities, afford promise that attention is awakening to the subject of the health and physical condition of the population, even amidst the fury of party passion and conflict in the United States. It was extremely satisfactory to learn, a few months since, that an engineer had been sent from New Orleans to London to examine, with the view to the adoption of, those improved modes of drainage carried out in one division of London, (and in one division only,) to which attention had been directed in the Report on the Sanatory Condition of the Labouring Population of Great Britain. It is to be hoped, that Mr. Villermé, who has done so much for vital statistics in France, will not relax in his exertions in showing the amount of depressing causes upon the condition of the

labouring classes, and that he and others will place before the French legislature the irrefragable evidence of immense waste of life in Paris, and show how well, on the lowest pecuniary considerations, it is worth while to buy off all the interests of the *porteurs d'eau* which stand in the way of improved supplies of water, and the means of cleanliness and health being introduced into every house; and all the interests of the *chiffoniers*, who stand in the way of the improved cleansing of its streets, and the purification of that offensively smelling low sanatory and undrained city. Yet it must be confessed, when the smaller administrative districts in this country are examined, not much is found to boast of.

It would be a most useful field of statistical inquiry, in this as well as in other countries, what is the expense in money, in sickness, and mortality at which such interests are sustained. Mr. Whitworth of Manchester has invented a machine, which, by the labour of one man and a horse in 10 hours, sweeps more cleanly a space which could only be swept in the same time by the labour of between 30 and 40 sweepers. He offers everywhere to sweep twice for the same sum, whatever it may be, that is now charged to the public for sweeping once. In only two or three out of the 80 petty jurisdictions into which the metropolis is divided, could he get even a trial of his machine, notwithstanding the demonstration of its success. The scavengers' interest everywhere overpowered the public interest in cleanliness and health, and even the immediate interests of the shopkeepers, in less dusty streets, and less destruction of furniture. He took out patents for the continent and America. At Paris the *chiffoniers'* interest was found to be impregnable. New York is distinguished by the defective cleansing of the lower districts, in which the pig has been the only scavenger. The condition of its streets has been lamented by Dr. Griscom, who has pointed out the great saving which might be produced by a better system; and Mr. Whitworth was at the expense of sending an agent to New York, in the full expectation of a success which he had no where else met with; but the more the efficiency of the machine and the saving of labour were demonstrated, the more he was assured, by profound statesmanlike men, that it would never answer for such a city as that. Was it in the form of the streets, or anything peculiar in their filth that a machine would not remove? far from it: the machine would remove too much. Wherein then was the impracticability? The statesmen's view was accidentally disclosed;—that it had NO VOTES: this was a country of universal suffrage, and a plan which, with every machine introduced, swept away 30 or 40 dependent votes, "would never answer." No public man could be found to support it. Dr. Griscom, the inspector of interments, who had ventured to propose an improved system of cleansing, by which the patronage of 100,000 dollars per annum in bad cleansing would be saved, and who had opened to the citizens in an able report other measures of efficient improvement, has been himself swept away from his office by a change of parties, which always sweeps away indiscriminately whatever public administrative talent may have arisen under such circumstances. The inventor, who would have been ruined by his invention if he had been a poor man, has foregone all efforts in America and in France, and has now endeavoured to enlist the aid of shareholders in a joint-stock company in this country.

The moral atmosphere under which a population is so situated is as offensive and depressing and pestilential as the physical atmosphere under

which it suffers; and it is grievous to experience, and melancholy to contemplate; but still there are facts of promise; we must hope and labour on; and some of the most beneficial labours of those who are fortunate in being placed above and out of the reach of such influences, would be in the production of complete statistical returns, demonstrating, as they must do when complete, the enormous expense in money as well as in pain, sickness, and waste of life, which would make it worth while to buy off, on the most liberal terms, every existing opposing interest to the most certain measures of human improvement.

If there could be intercommunication and simultaneous labours of statists in different places, based on local investigations, each might afford light to advance the labours of the other, and give to vital statistics a public estimation and use beyond any which they have at present obtained!

The subjoined tables are submitted only as imperfect approximations to more improved returns. In them will be found combined the mean ages and deaths prevailing amongst the several classes of society, so far as the present imperfect state of the registries (which the present Registrar-General has shown every disposition to improve) will allow them to be ascertained; together with the mean ages of the living population, and the proportions of births and deaths to the population, and the numbers of deaths from epidemics in each class. The deaths of children were taken up to the period of ten years, not as the best stage, but as the stage necessary for the special purposes for which the returns were obtained, namely, to ascertain the proportions of burials of adults in the Metropolis, all being classed technically as adults who are above that age.

The districts are placed in the order of the average age of death of the whole population during the year 1839, commencing with the highest average.

District.	Class	Number of Deaths of each Class.			Deaths from Epidemic.	Average Age at Death of all who die above 21.	Average Age at Death, including Children.	Years' Average premature loss of Life by		Proportionate Number of Deaths to Population.	Excess in Number of Deaths above a Healthy standard.
		Adults.	Children under 10.	Total.				Deaths above Age of 21.	Deaths of all Classes.		
		No.	No.	No.	No.	Years.	Years.	Years.	Years.	No.	No.
Greenwich. Population 80,811.	Gentry .	62	18	80	9	62	48	..	..		
	Tradesmen	150	97	247	42	54	31	8	8		
	Artisans, &c.	947	414	1,361	227	56	36	6	3	1 in 39	159
	Undescribed	141	110	251	35	58	30	4	9		
	Paupers .	109	21	130	17	62	52	..	..		
	Totals and	1,409	660	2,069	330	..	..	..	..	..	..
	Averages .	..	..	..	..	57	36	5	3	..	..
		No. of Births 1,780			Age of Living		28		Births 1 in 45		
Camberwell. Population 39,867.	Gentry .	58	23	81	11	58	38	4	1		
	Tradesmen	111	86	197	35	54	28	8	11		
	Artisans, &c.	137	134	271	54	51	26	11	13	1 in 51	100
	Undescribed	98	37	135	13	61	42	1	..		
	Paupers .	92	6	98	7	62	56	..	..		
	Totals and	496	286	782	117	..	..	..	..	..	..
	Averages .	..	..	..	..	57	34	5	5	..	..
		No. of Births 709			Age of Living		27·5		Births 1 in 44		

District.	Class.	Number of Deaths of each Class.			Deaths from Epidemic.	Average Age at Death of all who die above 21.	Average Age at Death, including Children	Years' Average premature loss of Life by		Proportionate Number of Deaths to Population	Excess in Number of Deaths above a Healthy standard.
		Adults.	Children under 10.	Total.				Deaths above Age of 21.	Deaths of all Classes.		
		No.	No.	No.	No.	Years.	Years.	Years.	Years.	No.	No.
Hackney. Population 42,274.	Gentry. .	50	11	61	6	61	47	1	..		
	Tradesmen	134	94	228	21	52	29	10	10		
	Artisans, &c.	117	120	237	35	55	27	7	12	1 in 56	155*
	Undescribed	80	102	182	36	60	25	2	14		
	Paupers .	46	4	50	1	67	61	..	..		
	Totals and	427	331	758	99	..	..	..	..	..	..
	Averages.	..	..	..	..	57	31	5	8	..	..
		No. of Births 995			Age of Living 26·10				Births 1 in 42		
St. George, Hanover Square. Population 66,433.	Gentry. .	110	28	138	12	59	45	2	..		
	Tradesmen	112	79	191	23	50	29	12	10		
	Artisans, &c.	528	344	872	130	47	27	15	12	1 in 50	272†
	Undescribed	18	17	35	3	61	32	1	7		
	Paupers .	77	12	89	8	59	51	3	..		
	Totals and	845	480	1,325	176	..	..	..	..	..	..
	Averages.	..	..	..	..	50	31	12	8	..	..
		No. of Births 1,260			Age of Living 28·3				Births 1 in 53		

* Mr. W. B. Robinson, the Registrar for West Hackney District, describes the condition of the houses where the greatest mortality prevails as bad, with murky superficial gutters within a yard of the front doors. Supply of water bad, quite insufficient for health, and that only three times a week; cleanliness not prevailing. All these require three things only to render them not less healthy than the other parts of the neighbourhood:—1. Proper and effectual drainage, and removal of superficial drains and gutters. 2. A constant supply of water, so as to wash away impurities in the drains, and enable the inhabitants to preserve a greater degree of cleanliness, &c. 3. That the houses should be kept in better repair, and frequently lime-washed; and the privies should be more frequently emptied, and not allowed to run over; and that any stagnant ditch, withiu a certain distance from houses, should be covered over.

† Mr. E. Jay, Registrar of Hanover-square District.—Name any particular streets, courts, or houses which, from the number of deaths occurring therein, and the nature of the diseases, appear to you to be unhealthy.—"I should therefore say that the most unhealthy streets, &c., in my district are Oxford-buildings, Brown-street, Toms-court, Thomas-street, Grosvenor market, Grosveuor-mews, George-street, and Hart-street; and to these, perhaps, may be added North-row, and Dolphin-court, and Providence-court, also the north end of Davies-street, adjoining Oxford-street. I have observed small-pox always to exist, when prevalent anywhere, in No. 24, George-street (Grosvenor-market); and much sickness and mortality have occurred in No. 18, Oxford-buildings. Oxford-buildings consist of 18 inhabited houses, containing many wretched families, principally Irish labourers; it was improved lately, in consequence of the exertions of humane individuals, but is still the seat of great poverty and vice. The ventilation here is so bad, that even visiting the houses is a disagreeable duty, from the foul air breathed even for a short space of time. The supply of water is good, and the drainage is reported by those who attend to the subject to be perfect, as it is throughout the parish; but the bad effluvia show that there must be some defect in this point. Three families frequently live in one room, some of the houses containing upwards of 50 persons; many of them live almost entirely on putatoes and herrings, and beer when thoy can get it. Want of fuel in many cases in winter. Brown-street.—Occupied by the poor and working class; the rooms very small, badly ventilated, and cleansed; the damp kitcheus, with frequently stone-floors, are lived and slept in. Living is bad, from the poverty which prevails here. Hart street.—Many poor families reside here, often in great want. Tolerably well drained. Toms-court.—Contains eight houses; inhabitants in a wretched state in many cases, partly from want of employ, partly from intemperance. Small pox and epidemics have raged here. George-street.—Some of the houses here are inhabited by working men of a better class, but it also contains others in a wretched condition, in point of cleanliness and ventilation, and much privation is suffered by the inhabitants. Grosvenor-market.—This spot is particularly close, being built almost in *cul de sac;* the houses are dark, badly ventilated, and most unhealthy; tho food of some of the poorest principally potatoes; a large slaughter house situated here adds to its unhealthiness; great want of fuel in winter. Grosvenor-mews.—Here the inhabitants are very thickly crowded, and among the children there is always much mortality; in one house, at the time of taking the census, there were 80 persons. The inhabitants consist of coachmen and their families, as do many of the mews in this district. This class is frequently iuton perate; they live over stables, are ignorant of the necessity of free ventilation, and many appear to suffer in consequence. New comers from the country complain of the want of free air, to which they ascribe their deteriorated health. Thomas-street.—Some of the houses in bad condition, and inhabited by the poorest families. No attention to ventilation. Supply of butchers' meat casual and infrequent. Pneumonia and bronchitis are frequently fatal in these poorer districts; and he who enters the damp, dark, underground kitchen,—in which all the occupants live and sleep, in which the room is made more close by a fire required for their cooking, the atmosphere is loaded with moisture from wet clothes hung across the narrow space to dry, and probably some child ill of disease,—sees that such a state of surrounding circumstances shuts out all chance of recovery in at least the majority of cases."

District.	Class.	Number of Deaths of each Class.			Deaths from Epidemic.	Average Age at Death of all who die above 21.	Average Age at Death, including Children	Years' Average premature loss of Life by		Proportionate Number of Deaths to Population.	Excess in Number of Deaths above a Healthy standard.
		Adults.	Children under 10.	Total.				Deaths above Age of 21.	Deaths of all Classes		
		No.	No.	No.	No.	Years.	Years.	Years.	Years.	No.	No.
Rotherhithe. Population 13,916.	Gentry. .	6	..	6	1	57	49	5	..		
	Tradesmen	12	2	14	2	50	40	12	..		
	Artisans, &c.	70	14	84	2	51	40	11	..	1 in 41	79
	Undescribed	78	121	199	50	52	19	10	20		
	Paupers .	33	5	38	3	68	56	..	..		
	Totals and	199	142	341	58	..	..	..	..	..	..
	Averages .	..	..	..	..	54	30	8	9	..	..
		No. of Births 385			Age of Living 26·7				Births 1 in 36		
St. Olaves. Population 18,427.	Gentry. .	4	..	4	..	64	..	..	..		
	Tradesmen	55	46	101	24	48	25	14	14		
	Artisans, &c.	603	215	818	107	43	30	19	9	1 in 19	229
	Undescribed	5	14	19	7	50	16	12	23		
	Paupers .	47	4	51	8	59	54	3	..		
	Totals and	714	279	993	146	..	..	..	..	..	..
	Averages .	..	..	..	..	45	30	17	9	..	..
		No. of Births 519			Age of Living 27·0				Births 1 in 36		
Kensington, (including Chelsea). Population 114,952.	Gentry. .	193	50	243	17	60	45	2	..		
	Tradesmen	204	120	324	33	50	30	12	9		
	Artisans, &c.	559	619	1,178	223	53	24	9	15	1 in 51	582
	Undeserибed	202	181	383	47	58	30	4	9		
	Paupers .	106	36	142	24	61	44	1	..		
	Totals and	1,264	1,006	2,270	344	..	..	..	..	..	..
	Averages .	..	..	..	..	55	29	7	10	..	..
		No. of Births 2,782			Age of Living 27·5				Births 1 in 41		
Islington. Population 55,720.	Gentry. .	83	35	118	11	61	42	1	..		
	Tradesmen	151	121	272	43	50	26	12	13		
	Artisans, &c.	177	260	437	108	47	19	15	20	1 in 55	261
	Undescribed	106	27	133	9	61	46	1	..		
	Paupers .	49	10	59	3	60	49	2	..		
	Totals and	566	453	1,019	174	..	..	..	..	..	..
	Averages .	..	..	..	..	54	29	8	10	..	..
		No. of Births 1,177			Age of Living 26·11				Births 1 in 47		
St. Martin in the Fields. Population 25,195.	Gentry. .	23	4	27	2	57	46	3	..		
	Tradesmen	60	47	107	22	45	24	17	15		
	Artisans, &c.	165	137	302	82	48	26	14	13	1 in 36	200
	Undescribed	89	112	201	42	51	21	11	18		
	Paupers .	68	4	72	4	65	60	..	..		
	Totals and	405	304	709	152	..	..	..	..	..	..
	Averages .	..	..	..	..	52	28	10	11	..	..
		No. of Births 601			Age of Living 28·4				Births 1 in 42		

District.	Class.	Number of Deaths of each Class. Adults.	Children under 10.	Total.	Deaths from Epidemic.	Average Age at Death of all who die above 21.	Average Age at Death, including Children.	Years' Average premature loss of Life by Deaths above Age of 21.	Deaths of all Classes.	Proportionate Number of Deaths to Population.	Excess in Number of Deaths above a Healthy standard.
		No.	No.	No.	No.	Years.	Years.	Years.	Years.	No.	No.
Poplar. Population 31,091.	Gentry. .	16	7	23	2	61	43	1	..		
	Tradesmen	44	40	84	14	51	26	11	13		
	Artisans, &c.	235	240	475	80	53	25	9	14	1 in 47	186
	Undescribed	19	10	29	2	63	36	..	..		
	Paupers .	45	3	48	2	64	53	..	..		
	Totals and	359	300	659	104	..	..	..	..	..	..
	Averages .	..	..	..	..	55	28	7	11	..	..
	No. of Births 1,106				Age of Living 25·10				Births 1 in 28		
Marylebone. Population 137,955.	Gentry. .	156	40	196	20	59	46	3	..		
	Tradesmen	198	172	370	57	51	27	11	12		
	Artisans, &c	682	759	1,441	251	48	23	14	16	1 in 45	857
	Undescribed	347	324	671	104	54	27	8	12		
	Paupers .	288	73	361	61	54	42	8	..		
	Totals and	1,671	668	3,039	493	..	..	..	..	..	..
	Averages .	..	..	..	..	52	28	10	11	..	..
	No. of Births 3,511				Age of Living 27·9				Births 1 in 39		
Stepney. Population 90,657.	Gentry. .	64	9	73	3	65	56	..	..		
	Tradesmen	169	104	273	47	53	31	9	8		
	Artisans, &c.	568	591	1,159	247	48	23	14	16	1 in 41	620
	Undescribed	203	274	477	101	56	22	6	17		
	Paupers .	189	28	217	28	63	54	..	..		
	Totals and	1,193	1,006	2,199	426	..	..	..	..	..	..
	Averages .	..	..	..	..	53	28	9	11	..	..
	No. of Births 2,502				Age of Living 26·6				Births 1 in 36		
St. Mary, Newington. Population 54,607.	Gentry. .	79	13	92	6	62	50	..	..		
	Tradesmen	75	64	139	23	50	26	12	13		
	Artisans, &c.	325	420	745	162	52	22	10	17	1 in 46	338
	Undescribed	75	76	151	31	59	30	3	9		
	Paupers .	64	6	70	1	60	55	2	..		
	Totals and	618	579	1,197	223	..	..	..	..	..	..
	Averages .	..	..	..	..	55	28	7	11	..	..
	No. of Births 1,620				Age of Living 26·8				Births 1 in 34		
St. Pancras. Population 129,711.	Gentry. .	151	49	200	15	61	45	1	..		
	Tradesmen	349	286	635	108	50	27	12	12		
	Artisans, &c.	622	674	1,296	287	47	22	15	17	1 in 43	934*
	Undescribed	269	354	623	199	55	23	7	16		
	Paupers .	232	49	281	47	61	50	1	..		
	Totals and	1,623	1,412	3,035	656	..	.	..	..	..	..
	Averages .	..	..	..	..	53	27	9	12	..	..
	No. of Births 3,264				Age of Living 26·10				Births 1 in 40		

* Mr. Worrell, the Registrar of the Gray's Inn-lane District:—"To ascertain and compare the healthy with the unhealthy parts of my district, I have placed against each street the whole number of deaths from all causes during the last five years. I have taken the number of deaths from a population of 5000, resident in

District.	Class.	Number of Deaths of each Class. Adults.	Children under 10.	Total.	Deaths from Epidemic.	Average Age at Death of all who die above 21.	Average Age at Death, including Children.	Years' Average premature loss of Life by Deaths above Age of 21.	Deaths of all Classes.	Proportionate Number of Deaths to Population.	Excess in Number to Deaths above a Healthy standard.
		No.	No.	No.	No.	Years.	Years.	Years.	Years.	No.	No.
West London. Population 33,629.	Gentry .	12	4	16	2	58	38	5	1		
	Tradesmen	83	103	186	41	49	22	13	17		
	Artisans, &c.	393	381	774	186	46	22	16	17	1 in 27	387
	Undescribed	149	17	166	23	47	38	15	1		
	Paupers .	99	16	115	26	64	55	..	..		
	Totals and	736	521	1,257	278	..	..	..	..	..	..
	Averages .	..	..	..	..	49	27	13	12	..	..
	No. of Births 698				Age of Living 27·7			Births 1 in 48			
Whitechapel. Population 71,758.	Gentry .	17	4	21	..	58	47	4	..		
	Tradesmen	142	130	272	42	50	26	12	13		
	Artisans, &c.	741	637	1,378	261	48	25	14	14	1 in 31	768
	Undescribed	116	313	429	107	58	16	4	23		
	Paupers .	166	37	203	38	63	61	..	..		
	Totals and	1,182	1,121	2,303	448	..	..	..	..	..	..
	Averages .	..	..	..	..	51	26	11	13	..	..
	No. of Births 2,103				Age of Living 26·2			Births 1 in 34			
St. James, Westminster. Population 37,407.	Gentry .	27	9	36	1	57	42	5	..		
	Tradesmen	68	66	134	23	51	26	11	13		
	Artisans, &c.	161	190	351	59	46	21	16	18	1 in 50	251
	Undescribed	52	83	135	28	52	20	10	19		
	Paupers .	81	15	96	7	58	49	4	..		
	Totals and	389	363	752	118	..	..	..	..	..	..
	Averages.	..	..	..	..	51	26	11	13	..	..
	No. of Births 844				Age of Living 28·2			Births 1 in 44			
East London. Population 39,655.	Gentry .	14	3	17	..	63	50	..	.		
	Tradesmen	134	164	298	76	53	23	9	16		
	Artisans, &c.	265	391	656	145	51	21	11	18	1 in 36	372
	Undescribed	36	10	46	1	50	38	12	1		
	Paupers .	87	11	98	18	65	57	..	..		
	Totals and	536	579	1,115	240	..	..	..	..	..	..
	Averages.	..	..	..	..	54	26	8	13	..	..
	No. of Births 1,235				Age of Living 27·0			Births 1 in 32			

what I consider healthy streets; and I have also taken the number of deaths from a population of 5000, resident in streets which I consider unhealthy. The 5000 occupying the best houses are composed of merchants, professional gentlemen, and the richer class of tradesmen; they occupy 723 houses, containing about 7800 good rooms; the streets are wide, well drained, and have a plentiful supply of water. The 5000 occupying the unhealthy streets are composed of the lower class of tradesmen, journeymen mechanics, labourers, and costermongers; they occupy 434 houses, containing about 2800 rooms, the best of which are little better than the worst of the 7800 before mentioned; the streets are mostly confined, the drains in a bad state, and in many places the accumulation of filth renders the atmosphere foul, whilst the supply of water is not very good. The number of deaths which I find in the healthy streets during five years, amongst a population of 5000, amounts to 325; and, during the same period, amongst 5000 occupying the unhealthy streets I find 613. No doubt many of the residents in the best houses go into the country, with the view of benefitting their health, and there die; but certain it is that many more of the poorer classes die in the workhouses and hospitals—so that, no doubt, amongst a certain number of poor, at least two deaths occur to one amongst the same number of rich. Having been a collector of rates upwards of 25 years, and, as a house agent, having had much to do with the letting of houses, I am thoroughly acquainted with the neighbourhood; and, having taken an active part in collecting and distributing voluntary contributions in times of distress and severe weather, I have been enabled to judge of the condition of the poor

District.	Class.	Number of Deaths of each Class.			Deaths from Epidemic.	Average Age at Death of all who die above 21.	Average Age at Death, including Children	Years' Average premature loss of Life by		Proportionate Number of Deaths to Population.	Excess in Number of Deaths above a Healthy standard.
		Adults.	Children under 10.	Total.				Deaths above Age of 21.	Deaths of all Classes.		
Holborn. Population 39,720.		No.	No.	No.	No.	Years.	Years.	Years.	Years.	No.	No.
	Gentry .	36	9	45	3	58	47	4	..		
	Tradesmen	144	164	308	75	52	24	10	15		
	Artisans, &c.	231	353	584	149	50	19	12	20	1 in 36	367
	Undescribed	21	6	27	2	54	41	8	..		
	Paupers .	155	32	137	35	60	46	2	..		
	Totals and	537	564	1,101	264	..	..	..	..	..	..
	Averages.	..	..	..	..	53	26	9	13	..	..
		No. of Births 969			Age of Living 27·2				Births 1 in 41		
Shoreditch. Population 83,552.											
	Gentry .	63	23	86	14	65	47	..	..		
	Tradesmen	153	150	303	63	47	23	15	16		
	Artisans, &c.	498	802	1,300	271	51	19	11	20	1 in 38	732
	Undescribed	150	75	225	34	57	37	5	2		
	Paupers .	234	49	283	56	57	46	5	..		
	Totals and	1,098	1,099	2,197	438	..	..	..	..	..	..
	Averages.	..	..	..	..	54	26	8	13	..	..
		No. of Births 3,058			Age of Living 26				Births 1 in 27		
City of London. Population 55,967.											
	Gentry .	32	12	44	3	63	43	..	..		
	Tradesmen	247	244	491	84	48	23	14	16		
	Artisans, &c.	213	270	483	94	50	22	12	17	1 in 50	403
	Undescribed	77	29	106	15	58	39	4	..		
	Paupers .	..	..	..	..	..	..	..	..		
	Totals and	569	555	1,124	196	..	..	..	..	..	..
	Averages.	..	..	..	..	51	25	11	14	..	..
		No. of Births 1,210			Age of Living 27·7				Births 1 in 46		
St. John & St. Margaret, Westminster. Population 56,718.											
	Gentry .	37	14	51	9	55	42	7	..		
	Tradesmen	82	102	184	47	46	20	16	19		
	Artisans, &c.	458	581	1039	264	48	21	14	18	1 in 39	521
	Undescribed	38	24	62	9	56	49	6	..		
	Paupers .	97	19	116	17	57	46	5	..		
	Totals and	712	740	1,452	346	..	..	..	..	..	..
	Averages.	..	..	..	..	50	25	12	14	..	..
		No. of Births 1,730			Age of Living 26·11				Births 1 in 33		

and their habitations, and I have always observed that sickness prevails much more in places where sewers and drains are bad than in other parts where the inhabitants are equally poor, but have more wholesome houses to live in. Any suggestion here as to remedy may, probably, be considered out of place, but having had much experience as a Commissioner of Pavements, as well as in several offices of local management during the last 25 years, and having given much attention to the subject (an evil which, in my opinion, affects the metropolis to an extent little imagined), I have no doubt as to the means of remedy, and improvement in the local administration being perfectly easy and effectual."

In another classification he arranges, from descriptions of streets with nearly equal population, the highest in each class; the relative proportions, and average ages of deaths, are ascertained to be as follows:—

	Population.	Deaths.	Average Age of Death.
Class 1	1432	97	35
Class 2	1465	119	32
Class 3	1448	157	25
Class 4	1386	200	21

The above statement proves that, out of a population of 1432 occupying the best houses, 95 deaths occurred within five years, 29 of which at and under five years of age; and that out of a population of 1386, occupying the worst houses, the whole number of deaths are 189, 104 of which at and under five years of age.

District.	Class.	Number of Deaths of each Class.			Deaths from Epidemic.	Average Age at Death of all who die above 21.	Average Age at Death, including Children.	Years' Average premature loss of Life by		Proportionate Number of Deaths to Population.	Excess in Number of Deaths above Healthy standard.
		Adults.	Children under 10.	Total.				Deaths above Age of 21.	Deaths of all Classes.		
		No.	No.	No.	No.	Years.	Years.	Years.	Years.	No.	No.
St. James, Clerkenwell. Population 56,709.	Gentry .	52	15	67	8	60	46	2	..		
	Tradesmen	99	109	208	50	49	23	13	16		
	Artisans, &c.	324	533	857	183	50	19	12	20	1 in 43	474
	Undescribed	82	17	99	6	59	44	3	..		
	Paupers .	76	14	90	2	60	50	2	..		
	Totals and	633	688	1,321	249	..	..	..	..	..	..
	Averages.	..	..	..	..	53	25	9	14	..	..
		No. of Births 1,771			Age of Living 25·11				Births 1 in 32		
St. George in the East. Population 41,351.	Gentry .	18	3	21	..	63	54	..	..		
	Tradesmen	66	72	138	29	49	23	13	16		
	Artisans, &c.	313	481	794	158	46	18	16	12	1 in 36	408
	Undescribed	62	14	76	3	60	46	2	..		
	Paupers .	93	14	107	14	61	52	1	..		
	Totals and	552	584	1,136	204	..	..	..	..	..	..
	Averages.	..	..	..	..	51	25	11	14	..	..
		No. of Births 1,404			Age of Living 26·6				Births 1 in 29		
St. Giles and St. George. Population 54,250.	Gentry .	66	32	98	15	60	40	2	..		
	Tradesmen	119	114	233	44	52	26	10	13		
	Artisans, &c.	280	584	864	221	51	17	11	22	1 in 36	528
	Undescribed	42	20	62	9	53	35	9	4		
	Paupers .	208	34	242	53	54	46	8	..		
	Totals and	715	784	1,499	342	..	..	..	..	..	..
	Averages.	..	..	..	..	53	25	9	14	..	..
		No. of Births 1,622			Age of Living 27·9				Births 1 in 33		
Strand. Population 43, 894.	Gentry .	47	21	68	8	59	40	3	..		
	Tradesmen	129	132	261	58	51	25	11	14		
	Artisans, &c.	299	382	681	178	48	61	14	18	1 in 41	413
	Undescribed	26	19	45	4	55	28	7	11		
	Paupers .	15	5	20	..	65	49	..	..		
	Totals and	516	559	1075	248	..	..	..	..	..	..
	Averages.	..	..	..	..	51	24	11	15	..	..
		No. of Births 957			Age of Living 27·3				Births 1 in 46		
Lambeth. Population 115,883.	Gentry .	141	64	205	19	58	37	4	2		
	Tradesmen	340	452	792	174	50	21	12	18		
	Artisans, &c.	452	704	1,156	245	49	19	13	20	1 in 46	979
	Undescribed	113	68	181	27	59	35	3	4		
	Paupers .	173	38	211	37	56	44	6	..		
	Totals and	1,219	1,326	2,545	502	..	..	..	..	..	..
	Averages.	..	..	..	..	52	24	10	15	..	..
		No. of Births 3,782			Age of Living 26·2				Births 1 in 31		

District.	Class.	Number of Deaths of each Class.			Deaths from Epidemic.	Average Age at Death of all who die above 21.	Average Age at Death, including Children.	Years' Average premature loss of Life by		Proportionate Number of Deaths to Population.	Excess in Number of Deaths above a Healthy standard.
		Adults.	Children under 10.	Total.				Deaths above Age of 21.	Deaths of all Classes.		
St. George, Southwark. Population 46,622.		No.	No.	No	No.	Years.	Years	Years.	Years	No.	No.
	Gentry .	32	9	41	5	61	45	1	..		
	Tradesmen	66	53	119	18	54	30	8	9		
	Artisans, &c.	371	591	962	248	53	20	9	19	1 in 39	492
	Undescribed	35	15	50	10	50	30	12	9		
	Paupers .	22	6	28	2	58	45	4	..		
	Totals and	526	674	1,200	283	..	..	..	..	..	..
	Averages.	..	..	..	..	53	23	9	16	..	..
		No. of Births 1,574			Age of Living 26·5				Births 1 in 30		
St. Luke. Population 49,982.											
	Gentry .	21	6	27	3	56	38	6	1		
	Tradesmen	62	52	114	17	49	25	13	14		
	Artisans, &c.	391	569	960	306	49	20	13	19	1 in 40	538
	Undescribed	85	49	134	17	58	35	4	4		
	Paupers .	..	..	..	..	..	..	..	..		
	Totals and	559	676	1,235	343	..	..	..	..	..	..
	Averages.	..	..	..	..	50	22	12	17	..	..
		No. of Births 2,271			Age of Living 25·11				Births 1 in 22		
Bermondsey. Population 34,847.											
	Gentry .	3	5	8	..	51	20	11	19		
	Tradesmen	66	59	125	16	48	25	14	14		
	Artisans, &c.	202	373	575	144	51	18	11	21	1 in 42	364
	Undescribed	24	26	50	6	45	21	17	18		
	Paupers .	62	14	76	15	57	47	5	..		
	Totals and	357	477	834	181	..	..	..	..	..	..
	Averages.	..	..	..	..	51	22	11	17	..	..
		No. of Births 1,151			Age of Living 24·7				Births 1 in 30		
Bethnal Green. Population 74,087.											
	Gentry .	39	11	50	4	61	46	1	..		
	Tradesmen	110	136	246	56	53	24	9	15		
	Artisans, &c.	468	874	1,342	369	51	18	11	21	1 in 41	794*
	Undescribed	69	19	88	6	57	44	5	..		
	Paupers .	76	19	95	19	65	49	..	..		
	Totals and	762	1,059	1,821	454	..	..	..	..	..	..
	Averages.	..	..	..	..	54	22	8	17	..	..
		No. of Births 2,674			Age of Living 25·2				Births 1 in 28		

* Mr. George Reynolds, the Registrar of the Church District, in answer to the question, In what parts of your district has the number of deaths registered in the years 1838, 1839, 1840, 1841, and 1842, been the greatest in proportion to the population? states, "In Beckford-row, Elliot-row, Alfred-place, Camden-gardens, Pitt-street, Pott-street, Camden-street, Wolverley-street, New York-street, and Pundersou gardens." And state generally the condition of those unhealthy streets, courts, and houses, as to drainage, supplies of water, cleanliness.—"The places I have named are entirely without drainage. Supply of water, one hand-cock to many houses. Cleanliness, great want of." Name any particular streets or parts which, according to the facts that have fallen under your notice, appear to you to be healthy, and with reference to the points adverted to in the preceding question, compare the healthy with the unhealthy portions of your district.—"My entire district, I think, would be in a much more healthy condition had we efficient drainage; instead of which, even this, the main road of the parish, is without a sewer, notwithstanding the Commissioners of Sewers have been repeatedly memorialized, and the following fact brought under their notice, that the cellars of the houses do not extend to the depth of 3 feet 6 inches below the level of the carriage-road, and yet there is an average of 18 inches of water during the greater part of the winter season; that many persons are obliged to use the pump for many hours daily to preserve their property." He gives the following letter from a medical officer of great experience:—

District.	Class.	Number of Deaths of each Class.			Deaths from Epidemic.	Average Age at Death of all who die above 21.	Average Age at Death, including Children.	Years' Average premature loss of Life by		Proportionate Number of Deaths to Population.	Excess in Number of Deaths above a Healthy standard.
		Adults.	Children under 10.	Total				Deaths above Age of 21.	Deaths of all Classes.		
		No.	No.	No.	No.	Years.	Years.	Years.	Years.	No.	No.
St. Saviour's. Population 32,980.	Gentry .	9	1	10	1	52	47	10	..		
	Tradesmen	45	43	88	17	52	26	10	13		
	Artisans, &c.	250	248	498	93	45	22	17	17	1 in 36	422
	Undescribed	89	198	287	65	51	15	11	24		
	Paupers .	23	9	32	4	59	40	3	..		
	Totals and	416	499	915	180	..	..	..	..	..	..
	Averages.	..	..	..	..	48	21	14	18	..	..
		No. of Births 1,145			Age of Living 27·3				Births 1 in 29		

"289, Bethnal-green-road, October 31st, 1842.

"Dear Reynolds,—As you are aware, I have attended many of the inhabitants of this road and its vicinity, and I do not hesitate to say that many of their diseases are to be attributed entirely to the want of drainage. They are,—1st, febrile diseases; 2nd, diseases of the respiratory organs; 3rd, nervous diseases; 4th, diseases of the digestive organs; and lastly, cacheetic diseases. Of the first kind, the very numerous cases of fever in the undrained districts that occur shortly after the autumnal rains, I take in the light of cause and effect. Rheumatism (acute and chronic) are the result of sleeping in houses, the walls of which absorb the surface water, and elevate it by capillary attraction to the height of two or three feet. The diseases of the respiratory and digestive organs are above the average number, and are attributable to the same cause. The nervous diseases I attribute to the poisonous gases exhaled from putrefying matter. They are—1st, epilepsy. In two families this disease attacked every one of the younger branches of the family, and they were cured by removal to another district. Many cases of spasm of a particular muscle, as one or two of the muscles of the face, the large muscle in front of the neck, and even some of the muscles of the arm; also frequent cases of the most inveterate hysteria have been temporarily relieved by removal, and have returned again on their return home. Of the cacheetic diseases, some are produced, others aggravated, by this cause. Scrofula is of this latter description. The cases of the children in your own family show that it is impossible to prevent suppuration, when the patient is constantly breathing a humid atmosphere. This has also been the case with one of your immediate neighbours. That form of scrofula, termed *tabes mesenterica*, I think, is, in many cases, brought on entirely by the same cause. Want of time prevents my extending the example of diseases attributable to this cause.

"I am, dear Reynolds, yours truly, "T. Taylor."